



Hacettepe University Graduate School of Social Sciences
Department of Economics

**DOES MORE COMPULSORY EDUCATION EMPOWER WOMEN?
EVIDENCE FROM TURKEY**

Dođa BAŞAR

Master's Thesis

Ankara, 2024

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ACCEPTANCE AND APPROVAL

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Bu alıřmadaki bütn bilgi ve belgeleri akademik kurallar erevesinde elde ettiđimi, grsel, iřitsel ve yazılı tm bilgi ve sonuları bilimsel ahlak kurallarına uygun olarak sunduđumu, kullandıđım verilerde herhangi bir tahrifat yapmadıđımı, yararlandıđım kaynaklara bilimsel normlara uygun olarak atıfta bulunduđumu, tezimin kaynak gsterilen durumlar dıřında zgn olduđunu, **Do. Dr. Ali BERKER** danıřmanlıđında tarafımdan retildiđini ve Hacettepe niversitesi Sosyal Bilimler Enstits Tez Yazım Ynergesine gre yazıldıđını beyan ederim.

[İmza]

Dođa BAŐAR

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ABSTRACT

BAŞAR Doğa. *Does More Compulsory Education Empower Women? Evidence from Turkey*, Master's Thesis, Ankara, 2024.

This thesis examines the causal relationship between education and women's empowerment, based on the variation in at least secondary school completion rates across birth cohorts caused by the 1997 education reform in Turkey. Using data from the 2013 and 2018 Turkey Demographic and Health Surveys (TDHS), the study evaluates the effects of extending compulsory education from 5 to 8 years on women's empowerment. In this study, women's empowerment is analyzed using two main dependent variables: the women's empowerment index, constructed using the PCA method, and the attitude toward violence score. Additionally, the causal impact of education on the two components of the women's empowerment index, namely the attitude toward gender roles component and the socio-economic component, is also examined. A fuzzy regression discontinuity design (RDD), which reliably captures the causal impact of education on women's empowerment, is adopted. The main findings of the study indicate that the increase in the rate of completing at least secondary school due to the extension of compulsory education results in improvements in the women's empowerment index and attitude toward violence scores. Similar results were found for the two components of the women's empowerment index. This study highlights the profound and positive effects of the 1997 education reform on women's empowerment and attitudes toward domestic violence, underscoring the critical role of education in advancing gender equality.

Keywords

Compulsory Education, Women's Empowerment, Turkey, Regression Discontinuity Design, Turkey Demographic and Health Survey

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LIST OF ABBREVIATIONS

2SLS	Two Staged Ordinary Least Squares
BEP	Basic Education Program
CSL	Compulsory Schooling Law
DD	Difference-in-Differences
DHS	Demographic and Health Survey
FEMI	Female Empowerment Index
GDI	Gender-related Development Index
GEM	Gender Empowerment Metric
GGI	Global Gender Gap Index
GII	Gender Inequality Index
GNAT	Grand National Assembly of Turkey
HUIPS	Hacettepe University Institute of Population Studies
IV	Instrumental Variable
MONTE	Ministry of National Education
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PCA	Principle Component Analysis
RDD	Regression Discontinuity Design
SDG	Sustainable Development Goal
SIGI	Social Institutions and Gender Index
SRDD	Sharp Regression Discontinuity Design
SWPER	Survey-based Women's Empowerment Index
TDHS	Turkey Demographic and Health Survey
TURKSTAT	Turkish Statistical Institute
UN	United Nations
UNDP	United Nations Development Program

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INTRODUCTION

The notion of the “empowered woman” is a central societal value across a wide array of nations, transcending their stages of development. This value is widely regarded as a fundamental hallmark of an advanced civilization. The aspiration for women’s strength and autonomy is rooted in the understanding that the positive contributions of empowered women extend beyond the individual. As women become empowered, this empowerment simultaneously enhances the resilience of their households and, in a broader sense, the entire community. According to Namoro and Roushdy (2009), the role of women as primary caregivers establishes them as pivotal agents in shaping the physical and psychological development of their progeny. Since children will be the future generations of societies in the long run, strong women will create strong children, and strong children will create strong societies. Moreover, there is a bidirectional relationship between women's empowerment and economic development (Duflo, 2012). Therefore, it is widely acknowledged that gender equality and the empowerment of women are indispensable for societal well-being.

The concept of women’s empowerment encompasses a broad spectrum of dimensions, including social, economic, cultural, political, and psychological aspects (Malhora et al., 2002). The multidimensionality and significance of the subject have garnered global attention. The Sustainable Development Goals (SDGs) ratified by the United Nations (UN) General Assembly in 2015, *Goal 5* specifically addresses gender equality and the empowerment of women (United Nations, n.d.). Empowering women is pivotal for achieving sustainable economic growth, social progress, and environmental sustainability, underscoring that without gender equality, sustainable development remains unattainable (Pathania, 2017). In many developing countries, women are adversely affected by gender inequality, which restricts their access to opportunities for improvement in education, employment, and living standards on par with men

(Samarakoon & Parinduri, 2015). Considering that Turkey is a developing country, mitigating gender inequality is a matter of significance for the country as well.

Since the emergence of feminism as an organized movement in the nineteenth century, there has been a significant advancement in women's rights and liberties (Delmar, 1986; Hooks, 2000). This expansion of deserved rights and freedoms has catalyzed profound transformations in both social and economic dynamics (Freedman, 2007). Notably, the increased access to educational opportunities has empowered women to assume more prominent roles in the business world, thereby fostering a generation of self-reliant and strong women who contribute substantially to societal progress (Goldin, 2014).

Feminism's pivotal role in advocating for gender equality has not only facilitated women's empowerment but has also underscored the critical importance of education as a tool for achieving this empowerment. By breaking down barriers to education and professional development, the feminist movement has enabled women to challenge traditional gender roles and to participate more fully and equally in all aspects of life, thereby driving forward the agenda of gender equality and social justice (Nussbaum, 2000).

The capacity of women to engage autonomously, either as individuals or collectively, within the paradigm of gender equality, represents a primary focus of contemporary scholarly research. Nussbaum (2000) underscores the importance of various social, economic, and cultural factors that enable women's full participation in all aspects of life. Among these factors, education emerges as a critical determinant (Goldin, 2014). Extensive empirical evidence highlights the positive effects of women's education on their well-being and the well-being of their children (Schultz, 2002; Glewwe, 1999; Behrman & Rosenzweig, Dincer et al., 2013). Education not only equips women with the knowledge and skills necessary for economic participation but also fosters critical thinking and empowerment, enabling them to challenge and transcend traditional gender roles (Sen, 1999). Consequently, the advancement of education is proposed to serve a multifaceted role: it contributes significantly to various domains such as health, economic stability, and social inclusion, while simultaneously promoting the overall empowerment of women (Kabeer, 2005). By enhancing educational opportunities for

women, societies can harness the potential for gender equality and achieve more comprehensive and sustainable development outcomes (Unterhalter, 2005).

Investigating the dynamics and potency of the relationship between education and empowerment presents a notable research inquiry. Examining the causal impact of education on women's empowerment within the contexts of human, economic, social, and cultural capital may elucidate these relationships (Schultz, 2002; King & Hill, 1997; Lloyd & Young, 2009). These mechanisms not only reveal the empowerment of women but also reflect the socio-economic standards of the countries. The 1997 compulsory schooling reform in Turkey offers a natural experimental environment for investigating these topics (Patrinos et al., 2019). Therefore, in this research, I am scrutinizing this reform as a basis to analyze the impact of education on women's empowerment.

In August 1997, compulsory education in Turkey was extended from 5 to 8 years (Cesur & Mocan, 2013). In the aftermath of this new regulation, there has been a notable rise in the rates of individuals attaining middle school and higher education, which has significantly influenced the outcomes of school enrollment (Aydemir et al., 2022). In this study, I examine the increase in educational participation resulting from the reform and its impact on women's empowerment in Turkey, utilizing various mechanisms and a range of indicators. Consequently, the investigations conducted in this thesis focus on the primary research question: "Does more compulsory education empower women?".

For this thesis, I utilized data from the 2013 and 2018 Turkey Demographic and Health Surveys (TDHS), published by the Hacettepe University Institute of Population Studies (HUIPS), because they provide comprehensive educational data and contain indicators that facilitate the analysis of women's empowerment. To estimate the causal effect of education on women's empowerment, I used the fuzzy regression discontinuity design (RDD) estimation method.

The structure of this research presentation is as follows: In the first chapter, I present the conceptualization of women's empowerment, the theoretical framework, and the key

aspects of the 1997 Compulsory Education Reform. In the second chapter, I provide a literature review on the subject. In the third chapter, I introduce the data and research design. In the fourth and final chapter, I discuss the main findings of the research and the results of the robustness analyses.

CHAPTER 1

BACKGROUND INFORMATION

1.1. CONCEPTUALIZATION OF WOMEN'S EMPOWERMENT

Empowerment is a multifaceted concept that has become integral to contemporary social studies discourse. It serves as an antidote to pervasive issues such as discrimination, unequal opportunities, and entrenched double standards (Cornwall, 2016). A glaring example of these double standards is the global disparity between genders (World Economic Forum, 2020). Despite significant advancements, gender biases rooted in historical, social, cultural, and religious dogmas persist into the 21st century, perpetuating gender inequality (Ridgeway, 2011). Although feminist ideologies have been advocating for women's rights since the 17th century, women continue to face discrimination across various social domains, underscoring the ongoing struggle for true gender equality (Tong, 2018; Connell, 2009). However, the ongoing presence of discrimination does not negate the significant advancements that have been made (Mishra, 2014). Post the 1970s feminist movement's ignition, there has been a marked increase in women's empowerment in social spheres (Mosedale, 2005).

Batliwala (1995) conceptualizes power as the capacity to control tangible assets, intellectual resources, and ideological frameworks, and defines empowerment as the dynamic process of challenging established power structures and gaining increased authority over the determinants of power. Understanding this definition is essential for appreciating the philosophical foundations of the concept of empowerment. Additionally, it emphasizes the importance of the subject of empowerment.

Empowerment encompasses a broad spectrum of meanings and applications. Various definitions have been posited by scholars and institutions, each tailored to their

respective contexts. The concept's multidimensional nature ensures that the dynamics of empowerment are equally varied (Pratley, 2016). Given the diversity of perspectives on its definition, scope, and underlying dynamics, a preliminary examination of the prevalent definitions of empowerment is advisable. This approach is particularly pertinent when discussing gender-related aspects of empowerment.

For example, empowerment is defined as a journey of change through which individuals deprived of opportunities to make strategic life choices are enabled to acquire this ability (World Bank, 2023). At this point, it is stated that there is a strong relationship between development and empowerment (Malhotra et al., 2002). This definition reveals the importance of the concept of empowerment for countries in both macro and micro terms. Furthermore, gender equality is of great importance in the policies implemented by the World Bank for development (World Bank, 2015). The promotion of women's empowerment as a development goal includes both the aim of providing social justice and stems from the view that women's empowerment is a tool for other purposes (Kabeer, 1999; Malhotra et al. 2002; Porter, 2013).

Moreover, the term 'empowerment' is laden with gravitas, foregrounding the concept of personal agency. It bridges the gap between action and necessity, culminating in substantial collective transformation (Tandon, 2016). When the concept's meaning is considered within the context of gender issues, the discussion of empowerment effectively integrates women into the political domain, encompassing both private and public spheres. It embodies a process of recalibrating the power dynamics between men and women, reshaping interactions at an interpersonal level and within societal institutions (Tandon, 2016).

Kabeer (1999) posits that empowerment is intrinsically linked to the ability to make choices. This definition is prominently featured in gender-based research on the subject. Empowerment is conceptualized as the procedure through which individuals or societies, previously deprived of the ability to make choices, are restored with this capability. In light of this definition, Kabeer (1999) articulates that empowerment initiates a transformative process of change. When addressing the reduction of gender

inequality, the transformative power of empowerment becomes particularly salient. Thus, expanding upon this definition may facilitate a more nuanced articulation of the concept of women's empowerment.

According to Kabeer (1999), the ability to make choices can be examined in three dimensions: resources, agency, and achievements. All human and social resources that assist in the development of individuals' ability to make choices are considered under the category of 'resources' (Kabeer, 1999). It is essential to understand that this encompasses more than just tangible resources; intangible resources such as intellectual assets and socio-cultural structures also play a decisive role. The 'agency' is characterized by the motivation that individuals ascribe to their actions. According to Kabeer (1999), the dimensions of purposes and meanings become prominent under this concept, and their importance is recognized on both an individual and societal scale. The third and final dimension 'achievements' underscores the necessity for an expanded range of skills in individuals' understanding of choice. Given the distinct *being* and *doing* perspectives of each individual, it is advocated that attention should be redirected from differences in preferences to the disparities in foundational capabilities (Kabeer, 1999).

Building upon this definition and dynamics of empowerment, prevailing views foreground the issue of gender inequality. The perspective put forth by Kabeer (1999), that the options available to women in a society are more constrained when compared to those available to men in the same context, underscores the necessity for gender-based studies. Additionally, Tandon (2016) raises the question of whether the choices made by women are shaped freely according to their life preferences or are constrained by the limits of available options. In this light, empowering women becomes a significant area of research in the efforts to diminish gender inequality.

The concept of women's empowerment encompasses a multifaceted range of dynamics. Its primary objective is to dismantle the various conditions and societal norms that perpetuate women's subjugation due to gender inequality. Historically, the concept of women's empowerment was articulated in the 1990s as a radical approach to

transforming power relations in favor of women's rights and greater equality between men and women (Batliwala, 2007).

Globally, numerous initiatives have been implemented and continue to be advanced within this domain. The empowerment of women and the achievement of gender equality stand as pivotal goals within the United Nations *Sustainable Development Agenda*, targeted for realization by the year 2030 (United Nations, n.d.). Furthermore, there exists a plethora of research entities such as *Pathways of Women's Empowerment*, established in 2006, and *The International Center for Research on Women (ICRW)*, founded in 1976, dedicated to elucidating the complexities inherent in this discourse (Institute of Development Societies, n.d.; ICRW, n.d.). The subject of women's empowerment can be dissected through various lenses, with indicators that are adaptable to the distinct cultural and social fabrics of societies. Therefore, research in this arena not only propels the movement toward empowerment but also yields valuable insights into broader socioeconomic challenges.

Numerous studies have substantiated the significant role women's empowerment plays in advancing economic development, positioning it as a critical element of socioeconomic enhancement (Chattopadhyay & Duflo, 2004; Yamauchi & Tiongco, 2013; Cornwall, 2016). While the pursuit of economic gains is distinct from the humanitarian goal of eradicating gender inequalities, this facet is equally crucial, particularly for developing countries (Soharwardi & Ahmad, 2020). A range of indicators – including fertility preferences, age at marriage, educational attainment, labor force participation, and possession of financial assets – serves not only as metrics of a country's economic progress but also illustrates the underlying drivers and ramifications of empowering women. These indicators, therefore, provide both a descriptive and analytical framework for assessing the interplay between women's empowerment and socioeconomic development.

In light of all these reasons mentioned, women's empowerment is indeed a highly significant and contemporary issue. Stromquist (1988) categorizes the empowerment of women into three fundamental components: cognitive, psychological, and economic.

The cognitive component primarily underlines the necessity for women to be cognizant of the quality of their life conditions. Women need to comprehend the extent to which their roles in society and their individual decisions are autonomous or dependent. This awareness can catalyze societal movements towards empowerment and achieving gender equality. The psychological component encompasses the development of women's sense of agency for individual or collective empowerment (Stromquist, 1988). Social and cultural dynamics play a pivotal role at this juncture. Lastly, Stromquist (1988) touches upon the economic component, pointing to the necessity for women to attain financial independence and engage in productive economic endeavors.

Considering these three fundamental components, it can be posited that investments in women's human, social, cultural, and economic capital can empower them and have an augmentative effect. The simultaneous enhancement of these capitals, thrusting women into a dimension where they are more empowered, can be effectively facilitated through the provision of an expanded and enriched educational experience.

1.2 THEORETICAL FRAMEWORK

The relationship between education and women's empowerment is multifaceted and complex. At its core, education contributes significantly to the social, cultural, economic, and human capital of individuals, suggesting that higher educational attainment should correlate with greater empowerment among women. However, the influence of women's education on their empowerment extends beyond this superficial understanding. This relationship involves a deeper exploration of how educational experiences interact with various socio-economic and cultural dimensions to affect women's roles and statuses in society.

Education exerts a profound influence on a multitude of mechanisms that shape human experiences, both directly and indirectly. On the empowerment of women, the impact of each of these mechanisms is especially critical. Beyond the realms of economic, social, cultural, and human capital, education also plays a pivotal role in enhancing various

dimensions of individual awareness (Erten & Keskin, 2022; Tandon, 2016; Nikkhah et al., 2012). These dimensions serve as exemplars of the diverse ways in which education can drive empowerment.

One of the key mechanisms that forge the link between education and the empowerment of women is human capital (Mitra & Singh, 2007; Nawaz, 2009). Human capital encompasses the knowledge, skills, and experiences possessed by individuals and the broader populace (Sehrawat & Giri, 2017). Education and training are recognized as one of the most significant contributors to human capital (Becker, 1992). Therefore, it can be expected that increased and improved education would have an augmentative effect on women's human capital.

Additionally, the literature also demonstrates that increased education facilitates women's *access to information* (Lee & Nguyen, 2020). Furthermore, Lee and Nguyen (2020) have identified access to information as one of the three dynamics between education and empowerment. This dynamic is frequently included in indicators of empowerment (Nguyen-Phung & Nthenya, 2023; Ewerling et al., 2017; Erten & Keskin, 2018). Access to information is directly related to an individual's human capital, further underscoring the significance of the human capital mechanism. On the other hand, it has been determined that access to information enables women to encounter diverse perspectives, which in turn facilitates their interaction with others (Duflo, 2012; Samarakoon & Parinduri, 2015). This suggests that the issue of access to information is as much related to human capital as it is contributory to individuals' social capital.

In the modern era, a noticeable increase in the investment of human capital targeted at women is observable across a range of countries, exceeding the resources devoted to men. This pattern is manifest in the concurrent rise in women's educational achievements and their life expectancy (Schultz, 1992). Simultaneously, the engagement of women in tertiary education and literacy initiatives is recognized as an integral factor in promoting gender empowerment, consistent with the tenets of human capital theory (Mitra & Singh, 2007; Hornset & Soysa, 2022). The enhancement of

women's knowledge and skills through education, and consequently their increased human capital, positively affects both their own and their families' socio-economic conditions (Singh, 2018). At this point, it can be stated that the improved state of human capital has an empowering effect on women.

Another significant relationship between education and women's empowerment is the economic capital mechanism. According to Bourdieu (2018), economic capital is defined as assets that are directly and immediately convertible into money and may be institutionalized in the form of property rights. Economic capital can be articulated at both individual and collective levels, and studies have demonstrated that this type of capital affects not only the individuals who possess it but also their offspring (Ripamonti, 2023). Cash, bonds, stocks, real estate, and other financial investments are considered under this type of capital.

The increase in women's financial freedoms, their incomes, and consequently their participation in the labor force facilitates an enhancing effect on their ownership over the components of this capital. According to Mitra and Kundu (2012), enhancements to women's capacity to earn an income serve to increase the well-being of both the women individually and their families, while simultaneously acting as a catalyst for a series of empowering cycles. At this point, the prevalent view in the literature is that education may serve as the fundamental enhancer of women's conditions, aiding in the augmentation of their economic capital.

Numerous studies in the literature have demonstrated that education has a positive impact on women's position in the labor market (Benavot, 1989; Cameron et al., 2001; Aslam et al., 2018; Chamlou et al., 2011). Lee and Nguyen (2020) have identified *labor force participation* as another of the three dynamics between education and empowerment. Such participation is crucial for establishing women's economic independence and has a direct effect on their societal well-being (Mammen & Paxson, 2000).

Empirical research indicates that higher education in women is not only associated with higher earnings but also yields significantly greater returns on their educational investment compared to men (Morrison et al., 2007). It is essential to consider the role of augmented economic strength at this point. Increased participation in the labor force is a substantial contributor to the autonomy of women and, by extension, to their empowerment (Mahata et al., 2017).

In addition to labor force participation and income level, education also contributes to women's asset ownership (Oladokun et al., 2018). Indicators of women's asset ownership are of great importance for monitoring women's empowerment, and property ownership has been included in many studies as an evaluated dimension (Sen, 1999; Malhotra et al., 2002). Furthermore, previous studies have demonstrated that the enhancement of women's economic status may have an empowering effect on their decision-making power within the household (Attanasio & Lechene, 2002; Morozumi, 2012; Antman, 2014; Heath & Tan, 2019).

Moreover, better employment opportunities and higher incomes significantly reduce the likelihood of women being subjected to and enduring partner violence (Aizer, 2010; Hidrobo & Fernald, 2013). Thus, the effect of education on increasing women's economic capital also presumably enhances their empowerment, which becomes clearer in light of this information. Consequently, the characteristics inherent in economic capital can serve as an effective bridge between education and women's empowerment.

Another mechanism linking education and the empowerment of women is social capital. Social capital is a concept that defines networks of association, norms of relationships, and trust connections facilitating interaction for economic and social benefits (Putnam, 2001). Empirical research has consistently shown that education exerts a direct influence on social capital at the individual level. Individuals with higher levels of educational attainment are reported to enjoy greater benefits across various measures of social capital compared to those with lower educational levels (Gesthuizen et al., 2008). Furthermore, education often serves as a primary determinant of social status and political engagement (Helliwell & Putnam, 1999).

As research on social capital has delved deeper, it is evident in the current literature that enhancing social capital has become both a method and a goal. From this perspective, enhancing individuals' social capital through education can also be seen as a method to influence various socioeconomic conditions. At this point, women's empowerment can be promoted by increasing social capital through targeted methods. Numerous studies in the existing literature have demonstrated that social capital has the potential to influence structures of women's empowerment (Ikhar et al., 2022).

The concepts of social capital and empowerment were initially brought together in the World Development Report 2000/2001 (World Bank, 2000). However, the concept of empowerment, in this context, did not specifically focus on the empowerment of women. Over time, policymakers have recognized that social capital can serve as a potent instrument for empowering women. Specifically, enhancing social capital has been deemed effective, particularly in household decision-making processes (Machio et al., 2020). Household decision-making possesses cross-cultural validity as a conceptual indicator of empowerment, and a woman who participates in decisions that affect her life is generally more empowered across various domains compared to women who do not participate (Kishor & Subaiya, 2005).

In addition to the freedom of household decision-making, the role of education in enhancing women's social status is another aspect to be examined under the mechanism of social capital. Social status is defined as a social position that plays a significant role in defining who individuals are within the hierarchy of society and in determining their relationships with other individuals (Haghighat, 2013). Consequently, more educated women occupying better social positions within the societal hierarchy can facilitate their access to power.

Another important dimension to be noted at this point is *assortative matching*, identified as another dynamic between education and empowerment (Le & Nguyen, 2020). It has been observed that better-educated women tend to marry or form relationships with better-educated men (Siow, 2015). Thus, as a reflection of the social and cultural capital provided by education, women's choice of partners is also positively affected and is

related to social capital. Additionally, an increase in the educational level of partners has been found to reduce the likelihood of violence against women (Simister & Makowiec, 2008).

Therefore, under the mechanism of social capital, women's participation in politics is also a noteworthy indicator. Women have historically been excluded from political structures and processes due to varying sociocultural characteristics across countries (Bari, 2005). This exclusion has been one of the critical issues impeding women's empowerment in the social sphere. The increase in political participation positively influenced by education will also lead to political empowerment. The political empowerment of women will primarily reduce gender inequality and, at the same time, open many doors of opportunity in the social arena (Parvin & Sarkar, 2021).

A final and quite significant perspective on the social capital mechanism is that the expansion of women's socioeconomic networks contributes to their savings and credit opportunities (Mayoux, 2001). Additionally, Mayoux (2001) has indicated that social capital also contributes to women's financial sustainability, their capabilities to combat poverty, and thus their empowerment. Consequently, social capital emerges as a mechanism that can be developed through education, and once enhanced, it significantly benefits women in various important aspects of their lives.

Another important mechanism between education and women's empowerment emerges as cultural capital. Bourdieu (1977) broadly defined cultural capital as an individual's familiarity with the dominant culture in society. According to a more detailed definition, cultural capital consists of attitudes, behaviors, preferences, and cultural signals that are commonly used for social and cultural inclusion or exclusion (Lamont & Lareau, 1988). Additionally, Diane Reay suggests that individuals' self-confidence and sense of entitlement constitute fundamental pillars of cultural capital (Reay, 2004). Consequently, individuals' norms and values are evaluated under this capital.

Education plays a crucial role in the development of women's cultural capital, which facilitates their life experiences and enables them to realize their potential (Akua-

Sakyiwah, 2016). Additionally, it has been identified in the existing literature that education enhances women's self-esteem, self-reliance, decision-making abilities, and awareness of their rights (Batool & Batool, 2018; Kishor & Gupta, 2004; Nayak & Mahanta, 2009). Based on these findings, it is evident that education contributes to women's cultural capital in various ways.

The empowering effects of education in this regard can be demonstrated by its ability to increase women's self-confidence, societal participation, to chance to make decisions for their own lives, and most importantly, providing the opportunity for them to use their rights and responsibilities as members of their societies (Engida, 2021). In addition, it has been determined that women's success factors are directly proportional to social and cultural capital (Bridges et al., 2022).

In summary, the causal impact of education on women's empowerment predominantly manifests through four distinct types of capital. The dynamics inherent to each capital mechanism and their significance within empowerment strategies may differ across various national contexts. It is crucial to underscore that education not only enhances women as individuals but also elevates their status within familial and societal frameworks, thereby facilitating comprehensive advancement.

The connections established between empowerment through education channels are recognized to have meaningful impacts on women's lives, influencing not only at the individual level but also within the broader micro and macro contexts. According to (Jackson, 2009), investments in the empowerment of women serve not merely to fortify them as individuals but also to enhance the overall well-being of entire families, communities, and nations.

Women who are more educated and consequently more empowered tend to establish a strong foundation within the micro-context, positively impacting intra-family dynamics, societal participation, and efforts to combat domestic violence (Malhotra et al., 2002; Kishor & Subaiya, 2008). At the macroscopic level, key concepts influenced by women's empowerment encompass societal welfare, economic growth, population

control, health, and gender equality (Duflo, 2012; Kabeer, 2005). The extensive reach of these concepts highlights the pivotal role of women's empowerment in driving societal progress (Sen, 1999). The multifaceted benefits of empowering women underscore its importance as a critical element for achieving comprehensive and sustainable development across various sectors (UN Women, 2015).

1.3. 1997 COMPULSORY SCHOOLING LAW IN TURKEY

1997 was an important year in which major changes took place in the education system in Turkey. Before this year, compulsory education in Turkey spanned five years. The decision for children to pursue further education after receiving their primary school diploma was influenced by a variety of factors including the family's economic status, aspirations, and living standards. Upon completing elementary education, students could then proceed to three additional years of middle and high school. Notably, at this stage, students were presented with two distinct educational pathways post-compulsory education: secular and vocational (Gulesci & Meyersson, 2013). This educational system was implemented in Turkey for a considerable period.

Shortly after the establishment of the Republic of Turkey, an education law called "Law for Consolidation of Instruction" was enacted in 1923 (Dulger, 2004). This law mandated the nationalization and consolidation of all public, private, religious, and foreign schools under the Ministry of National Education (MONE) (Dulger, 2004). The five-year compulsory education system, initiated during this period, continued until 1997. The concept of extending the duration of compulsory education was first proposed in 1961. Despite several attempts to implement this extension, it failed to achieve the intended success.

In February 1997, the Ministry of National Education (MONE) submitted a legislative proposal to the Grand National Assembly of Turkey (GNAT) aiming to extend the duration of compulsory education from five to eight years (Kirdar et al.2016). Under the influence of the political environment of the mentioned period, studies were initiated

quickly and the Basic Education Law (no. 4306) came into force on 16 August 1997 (Gulesci et al., 2020).

The political and social framework of the era played a significant role in the swift enactment of the legislation. A key objective of the 1997 Compulsory Education Reform was to ensure that the secular government of the time could safeguard young children from premature exposure to religious education (Kirdar et al., 2016). Previously, children could commence religious studies at an average age of 12. It was mandated that all schools in Turkey provide co-educational instruction exclusively in the Turkish language (Gulesci & Meyersson, 2013). The relaxation of these stipulations, particularly concerning religious education, served as a primary catalyst for the secular government to implement rapid and decisive legal actions (Abdurrahimov et al., 2018).

Another primary objective of the initiative is to enhance educational access for the most underserved 35% of the population (Dulger, 2004). It is important to highlight that this reform disproportionately impacts women in rural areas. A concerning disparity from this period is the lower rate of schooling among girls compared to boys (Gulesci & Meyersson, 2013). Furthermore, government analyses reveal that girls in rural settings are particularly disadvantaged by the inequity in educational opportunities (State Planning Organization of the Republic of Turkey, 1995). Thus, promoting educational access for this 35%, who face significant barriers to education, constitutes a critical measure towards achieving gender equality.

Additionally, another significant motivation for the reform can be defined as preparing for the transition to full membership in the European Union (Dinçer et al., 2017). In this context, creating equality of opportunity in society and enhancing the quality of human capital by increasing the duration of education is undoubtedly a logical step.

To comprehensively understand the transformative impact of the 1997 Compulsory Education Law (CSL) on Turkey's educational system, an examination of its technical aspects is essential. Once the law was implemented, it affected students who had completed the fourth grade or lower during the 1996-1997 academic year (Kirdar et al.,

2016). Consequently, it can be inferred that all students who began their first grade in 1993 or later were impacted by this policy.

If classified by birth cohorts, those expected to be affected by the policy are children born in January 1987 and later (Cesur & Mocan, 2018). However, there are uncertainties concerning the age at which children begin primary school. According to a decision published in the Resmi Gazete on August 7, 1992, all children who are 72 months old must start school (Resmi Gazete, no. 21308). Yet, this rule is not strictly enforced in Turkey. Starting school after the age of 6 is quite common (Kirdar et al., 2016).

Despite efforts to delineate the scope of the policy with precise provisions, the extent to which children born in 1986 were affected by the policy remains unclear. Although grade repetition at a young age is rare, some children have nonetheless been included in the group impacted by the policy due to this. Non-compliance with the school starting age has complicated the resolution of these issues. These are the two main factors that weaken the link between children's birth dates and their exposure to the new education system (Gulesci et al., 2020). In light of all these uncertainties, it can be stated that the exposure of children born after January 1987 to the reform is more certain (Erten & Keskin, 2020). Therefore, in subsequent sections, individuals born between December 1980 and December 1985 will be considered as the age group unaffected by the reform, while those born from January 1987 to January 1992 will be regarded as affected by the reform. Due to significant uncertainty regarding the impact of the reform on those born in 1986, individuals from this birth year will not be included in the analysis.

Following the enactment of the law, the most noticeable changes were observed in educational levels and diploma issuance. The integration of a 5-year elementary school with a 3-year middle school led to the establishment of an 8-year *Primary School* system (Dursun & Cesur, 2016). The elementary school diploma, previously awarded upon completion of the 5th grade, was discontinued. Instead, the diploma was now awarded to students who completed 8 years of primary education. This change was significant in terms of the reform's impact and naturally ignited substantial debates

during the period. As a result of the policy, raising the primary school graduation age from 12 to 15 impacted vocational training and participation in religious education (Dulger, 2004). Consequently, families wishing to opt for such educational choices were compelled to wait until their children reached high school age.

The policy targets the 35% of the population that is most difficult to reach in terms of education, predominantly residing in rural or urban fringe areas. Educational opportunities in these regions have a transformative impact on the futures of children living there. Poverty and gender discrimination have been identified as the two primary factors inhibiting schooling in these areas (Dulger, 2004). To overcome barriers arising from poverty, the Basic Education Program (BEP) includes significant incentives. Low-income students were provided with free books and meals, standardized shuttle services were implemented, old schools were renovated, many teachers were hired, and numerous other innovations were introduced to support the goal of promoting education (Erten & Keskin, 2018). These incentive mechanisms have been designed to prevent students from being unable to access educational opportunities due to poverty.

When it comes to gender discrimination, there are various reasons why increasing the schooling rate of girls is more challenging compared to overcoming the barrier of poverty. Suppressed female roles, security, and moral issues, and the overlap of starting middle school age with adolescence are just a few of these challenges (Dulger, 2004). Additionally, one of the most serious issues that emerge at this point for girls is the increased risk of early marriage following the end of compulsory education (Kirdar et al., 2009; Kirdar et al., 2016). Despite all these gender-based disadvantages, one of the most significant effects of the 1997 reform has been observed in girls, particularly those living in rural areas (Dulger, 2004).

Girls living in rural areas, who were the most disadvantaged group under the old system, have also benefited positively from the new system, gaining the opportunity to remain in education for an additional three years. The completion rate of the 8th grade among women living in rural areas has increased by 30-40% following the policy (Kırdar, Dayıoğlu & Koç, 2016). In addition to this surprising increase, various findings

have been reached that indicate the positive effects of the post-compulsory education process. This situation can be observed when looking at the rates of high school completion post-policy. Education completed by the age of 17 has increased by approximately 1.5 years for rural women and by approximately 0.8 years for urban women (Kırdar, Dayıođlu & Koç, 2014). Furthermore, the enrollment rate of girls in the 6th grade increased by 162% in the first year of the program (Dulger, 2004). Consequently, it can be stated that the reform has contributed to educational equity for girls.

Additionally, regardless of gender, the increase in the duration of compulsory education has ensured equality of opportunity in education. Individuals born in 1987 and onwards were educated according to the new compulsory education law. According to statistics, between 1996 and 2000, the enrollment rates for grades 6-8 increased by 42%. Furthermore, the enrollment disparity between the more developed western regions of the country and the less developed eastern regions has decreased (Dinçer et al., 2013). An even more striking result is that since the implementation of the program, the net enrollment rate for eight years of education has risen from 75.8% to 95% (Dulger, 2004).

In light of all this information, the increased duration of compulsory education due to the 1997 CSL may have various effects on women's empowerment in Turkey. Girls living in rural areas, who are the most educationally disadvantaged group in Turkey, have benefited the most from this policy change. The swift enactment of the policy and the refusal to back down despite all debates have been crucial for the successful implementation of the reform. In conclusion, based on all the aforementioned information, this thesis examines the causal effects of education on women's empowerment by employing the change in the duration of education introduced by the 1997 CSL as an instrumental variable.

CHAPTER 2

LITERATURE REVIEW

In this section, I critically examined the relationship between compulsory education and the empowerment of women, utilizing existing literature categorized under three subheadings. First, I focused on studies conducted in developed countries. Following this, I analyzed studies conducted in developing countries. Finally, I thoroughly reviewed similar studies undertaken within the context of Turkey. The primary reason for categorizing the literature review in this manner is that the issue of women's empowerment is often analyzed in economic and socio-cultural contexts. While developed countries stand out with high-income and stable structures, developing countries exhibit unique dynamics and development processes (Todaro & Smith, 2020). Turkey is also a developing country, but it is evaluated in a separate category due to being the focal country of this thesis and having many economic and socio-cultural differences from other developing countries. Therefore, by considering these differences between countries, I aim to conduct a more comprehensive and meaningful literature review.

Furthermore, in this chapter, I have evaluated only studies conducted within the framework of causality analysis. The reason for this limitation is the importance of the differences between correlation analysis and causality analysis. While correlation analysis determines the relationship between two variables, causality analysis shows how one variable affects the other (Pearl, 2009). Causality analysis is necessary to understand the impact of education on women's empowerment, as it more clearly demonstrates how education contributes to women's economic, social, and political empowerment. To avoid structural inconsistencies in the thesis and to accurately assess the impact of education on women's empowerment, I have confined the literature review to studies that employ causality analysis.

2.1. AN EVALUATION OF STUDIES FOR DEVELOPED COUNTRIES

The relationship between the duration of education and women's empowerment is a globally intriguing research topic. Although women in developing countries suffer more from gender inequality, empowering women is a common goal and is intensively studied even in developed countries (Dollar & Gatti, 1999; Skirbekk et al., 2004; Deole & Zeydanli, 2021). Therefore, in this subsection, I examine empirical research conducted in developed countries that investigates the effects of education on the dynamics of women's empowerment.

In this context, Skirbekk et al. (2004) utilized changes in Sweden's compulsory education law to examine the timing of demographic events in early adulthood among women. The study employed birth month data and calculated differences in the age at graduation, identifying significant and long-lasting effects based on the educational disparities. Skirbekk et al. (2004) noted that 45% of the 11-month age difference at graduation between women born in January still persisted at the age of first birth, a considerable impact given that the first birth typically occurs 8-10 years after the completion of compulsory education. Additionally, 36% of the graduation age difference continued to influence the age at second birth, and 32% was reflected in the age at first marriage (Skirbekk et al., 2004). Thus, the study posited a strong relationship between significant demographic events in adulthood and the duration of compulsory education. On the other hand, while a weak effect on the probability of marriage was observed, no evidence was found regarding an impact on the likelihood of having a first or second child (Skirbekk et al., 2004).

Another study conducted by Deole and Zeydanli (2021) utilized various international datasets specifically focusing on European countries. The findings from the analysis indicate that increases in the duration of education in Europe promote egalitarian attitudes towards gender roles. Moreover, the study emphasizes that the moderating effects of education are particularly significant among women. Consequently, it has

been observed that more education not only influences the timing of key life events for women but also positively affects their attitudes toward gender inequality.

In another study by Kravdal and Rindfuss (2008), the relationship between the increase in education duration and fertility preferences among Norwegians was examined. The study primarily found that higher education delayed the age at first birth. Furthermore, the likelihood of having a second and third child in response to an increase in women's education was also investigated (Kravdal & Rindfuss, 2008). This study identified a gradually decreasing negative net effect, where Skirbekk et al. (2004) had found no significant impact. The negative influence of increased education on fertility preferences for women was associated with their positions in the labor market.

Differences in studies examining the impact of education on women's empowerment stem from various factors. Cultural context can create significant disparities in gender roles and norms across countries, while economic factors and labor market conditions influence the relationship between education and women's life choices (Barro & Lee, 2013; Psacharopoulos & Patrinos, 2018). Additionally, differences in educational policies, including the structure and content of education systems, can diversify the outcomes of education duration (Hanushek & Woessmann, 2012). Methodological approaches, including data sources and analysis techniques, also contribute to variability in findings (Psacharopoulos & Patrinos, 2018).

As noted, the effect of increasing the duration of education on the dynamics of women's empowerment has been examined in Sweden, Norway, and other developed countries in Europe, yielding various findings. In the subsequent subsection, I examined studies conducted specifically for developing countries.

2.2. AN EVALUATION OF STUDIES FOR DEVELOPING COUNTRIES

The relationship between education and the empowerment of women has emerged as a prominent topic of investigation in numerous studies focusing on developing countries. Some studies have utilized DHS data to forecast women's empowerment, thereby exhibiting similarities in terms of data sets with this thesis. Other studies have converged with this thesis in terms of the research designs employed. Furthermore, legislative reforms extending compulsory education periods have been enacted in certain developing countries, and the causal effects of prolonged education on empowerment have been investigated in this thesis. In this section, I reviewed similar research conducted in developing countries.

The study by Le and Nguyen (2020), which spans seventy developing countries, employs the fixed effects framework to investigate the influence of education on women's empowerment. Their findings affirm that education significantly boosts women's autonomy in household decision-making, impacting both fiscal and non-fiscal decisions. An additional year of education is associated with an incremental increase in women's decision-making authority, notably enhancing their control over large household purchases and healthcare decisions. Nonetheless, the impact of education on decisions regarding personal and spousal earnings remains statistically inconclusive.

Le and Nguyen (2020) also extend to the dynamics of education and relational friction, quantified through indices measuring physical violence and psychological abuse. A discernible negative correlation exists, with increased educational attainment correlating with reduced instances of physical violence—including slapping, punching, and strangling—by 0.8%, 0.8%, and 0.5% per additional year of education, respectively (Le & Nguyen, 2020). Similarly, higher education levels are linked with a decreased likelihood of psychological abuse from spouses. Overall, the study confirms that

education significantly contributes to increased decision-making power and reduced domestic friction, fostering greater empowerment for women in developing nations.

In a separate study, Sahue (2019) employed a Regression Discontinuity Design to analyze the effects of the 1980 educational reforms on women born before and after 1965. Post-reform, women born after 1965 saw a 17% increase in schooling years and a 21.2% higher probability of starting secondary education. Literacy rates also improved by 6.7%. According to the findings of Sahue (2019), advancements in education have led to increased participation in the labor market and enhanced freedoms, but, contrary to the findings of Le and Nguyen (2020), they have also increased the risk of domestic violence. Statistically, the likelihood of experiencing sexual violence has increased by 7.7%, and incidents resulting in bruises have risen by 10.1%, with both findings being statistically significant. These results suggest that higher education levels may not improve women's bargaining power within the household and could increase their risk of violence.

In a similar study, Samarakoon and Parinduri (2015) examine the effects of the 1978 educational policy change in Indonesia, which extended the school year. Their analysis uses a fuzzy Regression Discontinuity (RD) design, which capitalizes on the fact that the policy first impacted cohorts born in 1971 and 1972, thus creating a discontinuity in the likelihood of experiencing an extended school year for these cohorts. The study assesses the effects of increased educational duration on women's reproductive behaviors and empowerment. Findings indicate that each additional year of education correlates with significant changes in fertility and reproductive health practices. Specifically, an additional year of education is associated with a reduction of 0.4 in the average number of live births among women. Furthermore, the probability of women engaging in preventive health practices increases substantially; contraception usage, breastfeeding, and receiving tetanus injections rise by 10%, 3%, and 12%, respectively (Samarakoon & Parinduri, 2015). More pronounced benefits are observed among women who complete senior high school. Completing this level of education is linked to a reduction of two live births per woman and increases the likelihood of using

contraception, breastfeeding, and receiving tetanus injections by 60%, 16%, and 57%, respectively (Samarakoon & Parinduri, 2015).

In another study, Nguyen-Phung and Nthenya (2023) conducted a detailed examination of the relationship between educational attainment and women's empowerment. The research was grounded in the educational structure changes made in 1985. Data from six waves of the nationally-representative Kenya Demographic and Health Survey (KDHS) were utilized (Nguyen-Phung & Nthenya, 2023). The analysis employed the Two-Stage Least Squares (2SLS) estimation method. In the first stage, the methodology for estimating the education variable using a female schooling instrumental variable was modeled. In the second stage, the impact of the modeled education variable on women's empowerment was measured.

In the initial phase of the research, Nguyen-Phung and Nthenya (2023) established that the educational reform implemented in 1985 resulted in an approximate increase of two years in the education level of women impacted by the reform. Subsequent findings reveal the multifaceted effects of additional education years. Specifically, each additional year of education delayed the age at first birth by approximately 0.35 years. Furthermore, there was a noted reduction in gender-biased attitudes by 1.3 percentage points and a decrease in intimate partner violence by 2.6 percentage points. Moreover, the research indicated an enhancement in women's capacities for household decision-making by 0.6 percentage points.

As observed in the literature review, studies focusing on the impact of education on women's empowerment in developing countries commonly utilize external shocks, such as educational reforms, to strengthen causality analysis. Similarly, DHS data are preferred in such research. The estimation methods employed in the studies reviewed predominantly include regression discontinuity design, alongside two-stage least squares and sister fixed effects models. The dimensions of women's empowerment are generally framed around women's labor force participation, opportunities for decision-making within the household, domestic violence situations, reproductive health behaviors, and ownership of assets.

The impact of increased educational attainment on women's decision-making power within households is a common theme explored in these studies. Two studies (Le & Nguyen, 2020; Nguyen-Phung & Nthenya, 2023) found that increased education positively influenced women's intra-household decision-making power, while one study (Samarakoon & Parinduri, 2015) found no statistical evidence supporting this effect. Another frequently investigated dynamic is domestic violence. Here, two studies (Lee & Nguyen, 2020; Nguyen-Phung & Nthenya, 2023) identified that increased education led to a reduction in domestic violence, whereas one study (Sahue, 2019) found statistically significant results only for women being self-employed. Studies measuring the impact of increased education on women's access to information have similarly reached positive outcomes. Lastly, two studies have found that an increase in education reduces the educational gap between women and their husbands, positively affecting the assumption of assortative matching (Le & Nguyen, 2020; Nguyen-Phung & Nthenya, 2023).

The studies reviewed provide a comprehensive understanding of the various dimensions of women's empowerment influenced by education. The consistent theme across these studies is the positive correlation between increased education and enhanced empowerment metrics, including decision-making power, reduction in domestic violence, and improved reproductive health practices. However, the mixed findings regarding the risk of domestic violence suggest a need for a more nuanced analysis, recognizing that the outcomes of educational attainment can be multifaceted and context-dependent.

Incorporating these studies into the literature review section of the thesis has provided a framework showcasing the multifaceted impacts of education on women's empowerment. This strengthens the thesis by grounding its arguments in a well-established body of empirical research and highlighting areas where further investigation may be necessary. In the subsequent section, I evaluate studies conducted in Turkey, examining the causal effects of education on women's empowerment concerning country-specific characteristics.

2.3. AN EVALUATION OF STUDIES FOR TURKEY

The impact of education on women's empowerment and related dimensions in Turkey has been analyzed by various studies. Recent educational reforms in Turkey have been the focal point of these analyses. This section will compile studies investigating the effect of the increase in education duration resulting from the 1997 CSL on women's empowerment in Turkey. Particular emphasis will be placed on studies that utilize the TDHS data in their research on this topic.

In Turkey, research has also explored empowerment dynamics similar to those in developing countries. These include marriage decisions, fertility preferences, contraceptive use, domestic violence, partner characteristics, and labor force participation. To facilitate tracking and enable the comparison of outputs from research conducted within analogous domains, I intend to implement a categorization based on the aforementioned empowerment dynamics.

In the literature, noteworthy studies investigating the impact of increased education duration from 5 to 8 years as a result of the 1997 CSL on women's *marriage decisions* include works by Gulesci and Meyersson (2012), Kirdar et al. (2009) and Kirdar et al. (2016). A significant common characteristic of these articles is their use of the TDHS data source and similar estimation methods.

Gulesci and Meyersson (2012) examine the religious and social ramifications of the extension of mandatory female education from 5 to 8 years in Turkey. Utilizing the RDD approach, their research establishes causal relationships based on data from the TDHS-2008. Their analysis focuses solely on a sample of ever-married women, utilizing the birth date cutoff of September 1986 to differentiate affected cohorts under the new educational law.

Gulesci and Meyersson (2012) first noted that there was an expected increase in the level of education for all women. Upon examining marriage preferences as a result of increased education levels, they have observed a weak positive correlation between

education and age at first marriage. An additional year of schooling has been associated with a delay in marriage by 2.5 months. The authors note that due to the low average age of first marriage in Turkey, analyzing women in their early twenties within the study proves to be insightful. According to the outcomes of the RDD, the probability of the treatment group marrying after the age of 16 is noted to be 6% higher, with this effect being marginally significant. Additionally, it was found that women in the treatment group were 21% more likely to choose their spouses independently compared to those in the control group.

According to research by Kırdar et al. (2009), utilizing the 2003 Turkey Demographic and Health Survey (TDHS-2003), it has also been established that the policy led to a reduction in the risk of early marriage for women. In the study, the extension of compulsory education duration in 1997 was considered as the source of exogenous change in education. They have examined the effects of this change on women's timing of marriage and fertility. According to the findings of the study, the proportion of women married by the age of 17 has decreased from 15.2% to 10%. Considering that those exposed to the reform exited compulsory education at the age of 14, it is highlighted that the reduction in the risk of marriage at the age of 17 signifies that the effect of the policy persists for a significant duration thereafter. Additionally, evidence has been found that an increase in education reduces the likelihood of marriage before the age of 18. The probability of women affected by the policy marrying before the age of 18 is 36% lower.

Efforts have been made to precisely determine the age groups where the policy has led to a decrease in the risk of marriage, for which the policy variable has interacted with the age groups of 10-11, 12-14, and 15-17. According to the results, the probability of marriage within the age range of 12-14 has decreased by 54% due to the policy. No decrease in the likelihood of marriage before the age of 11 has been observed and this outcome has been attributed to the very few individuals marrying at this age. Although a reduction in the risk of marriage between the ages of 15-17 has been observed, the effect is not statistically significant.

Considering the analysis of these two studies (Gulesci & Meyyerson, 2012; Kirdar et al., 2009) that investigate the impact of education on women's marital decisions in the literature, it can be stated that the results are relatively consistent. Although the research designs vary, the common findings of the studies indicate that increasing compulsory education reduces the likelihood of women marrying at an early age. Kirdar et al. (2009) have provided significant statistics on this matter. Additionally, Gulesci and Meyerson (2012) in their study have explored the likelihood of women choosing their husbands as a result of increased education, and have obtained positive outcomes. Following the findings on marriage preferences, fertility preferences have also been explored as an important dimension in this area.

Fertility preferences frequently emerge as a prevalent theme in the literature concerning women's empowerment, observed across both developing nations and Turkey.

Alongside the two articles previously reviewed, Dincer et al. (2013) have contributed significantly to this discourse. Dincer et al. (2013) examine various outcomes related to women's educational achievements, fertility rates, children's health, and measurement of empowerment, utilizing the 1997 educational policy change. Research utilized data from TDHS-2003 and TDHS-2008. Estimates were presented using the IV regression model. The authors conducted their analyses based on the ever-married sample and examined women between the ages of 18 and 29 at the time of the survey. In the examined subsample, ever-married women aged 18-22 were categorized as *younger*, while those aged 23-29 were classified as *older*. Members of the *older* cohort were born in 1985 or earlier and are therefore not expected to be affected by the new policy. Conversely, the *younger* cohort consists of women born in 1986 and later, who are assumed to have been influenced by the new policy (Dincer et al., 2013).

Initially, descriptive data concerning the educational outcomes of these two cohorts were analyzed. According to 2008 data, 34% of the *older* cohort and 53% of the *younger* cohort had received at least eight years of education (Dincer et al., 2013). The authors noted that the 19 percentage point difference between the two cohorts could be attributable to the compulsory schooling law or another factor that differentiates educational outcomes between the cohorts. To estimate the impact of other possible

factors, the educational achievements of the two cohorts were compared in the pre-policy period. According to 2003 data, 27% of the *younger* cohort and 32% of the *older* cohort had received eight years of education (Dincer et al., 2013). According to the crude Difference-in-Difference (DD) estimates, there has been a 24% increase in the proportion of ever-married mothers with at least eight years of education.

In the study Dincer et al. (2013) analyzed women's fertility preferences were analyzed using both OLS and IV estimation methods. According to OLS estimates, *younger* cohort (18-22) women with at least eight years of education have 0.5 fewer pregnancies compared to those with less than eight years of education. Additionally, they have 0.4 fewer children. Furthermore, the study makes inferences regarding child mortality, revealing a lower mortality rate of 0.03 for children under the age of 5. IV estimates show larger changes at absolute levels compared to OLS estimates. A 10% increase in the proportion of women with at least eight years of schooling is noted to reduce the number of pregnancies by 0.13 and the number of children between 0.11 and 0.16. The results concerning child mortality under the age of five from this analysis are statistically insignificant.

Fertility preferences were also examined in the studies by Kırdar et al. (2009) and Güneş (2016). According to Kırdar et al. (2009) findings, the policy change increasing education has reduced the likelihood of a woman giving birth to her first child before the age of 18. It has been observed that the probability of giving birth at a specific age decreased by 45%. Additionally, following the change in education policy, the proportion of women giving birth to their first child by age 17 has declined from 6.2% to 3.5%. In the age-group specification, statistically significant results have been obtained, particularly indicating a decrease in the first birth probabilities of women aged 15-17.

Kırdar et al. (2009) have added that the increase in the age at first birth may be linked to the rise in the age of marriage due to policy changes. The fact that the policy change has the greatest effect on marriage at ages 12-14 and that the impact on fertility is more pronounced at ages 15-17, supports these assumptions. Therefore, it has been

determined that the negative impact of education on fertility preferences generally stems from its negative effect on the age of marriage, and consequently, an increase in education level does not alter the timing of fertility once a woman is married.

In the absence of year controls, the policy reduced the probability of giving birth to a first child by 72%. In addition, age controls show that the probability of giving birth increases with age. Additionally, wealth controls have been implemented to analyze fertility preferences. The results are significant except for the bottom three groups. The wealth effect is pronounced for women in the highest quintile. It has been found that the probability of women in the top wealth quintile giving birth to their first child is 59% lower compared to women in the lowest quintile.

In addition to these findings in the literature, Kırdar et al. (2016) also present different observations on the policy's impact on fertility preferences. According to analysis, the new policy reduces the likelihood of women giving birth for the first time by the age of 17, but the effects of the policy disappear after the age of 18 for the age at first birth. Based on the study's results, the percentage of women who have had their first child by age 17 has fallen by 4.6 points, amounting to a 57% decrease due to the policy. Yet, the fertility hazard rates at age 18 for these women are found to be higher than what would have been expected without the educational reform. Moreover, consistent with their previous articles Kırdar et al. (2009), they have noted that did not encounter any policy effects on the duration between marriage and the first birth once the marriage had taken place. Drawing from these results, it has been suggested that the policy has a very strong incarceration effect on the timing of marriage and fertility, but the human capital effect appears to be either short-lived or non-existent (Kırdar et al., 2016).

In another study, Güneş (2016) examines the causal relationship between female education and teenage fertility using the 1997 education reform in the CSL. According to the findings of this study, initially, the reform led to an approximate 6 percent increase in the secondary school completion rates among girls of primary school age. Based on this increase, the effects on fertility were analyzed. Güneş (2016) found that completing primary school reduces teenage fertility by 0.37 births per female.

Additionally, it was noted that the decline in fertility was most pronounced in areas with lower population density and higher agricultural activity.

Following the topic of fertility preferences, the studies I mentioned have also explored the impact of education on the *use of contraceptive methods* (Güneş, 2016; Dincer et al., 2013; Gulesci & Meyersson, 2012). According to the findings of Güneş (2016), completing secondary school increases the use of modern contraceptive methods. This result is attributed both to the contribution of education to the ability to acquire knowledge and to changes in fertility preferences (Güneş, 2016). Similarly, Dincer et al. (2013) have reached the same conclusions and noted that as a result of increased education, there has been an increase in women's use of modern contraceptive methods. Additionally, they have found that women's knowledge of their ovulation cycles has improved (Dincer et al., 2013). Gulesci and Meyersson (2012) have examined from a different perspective how increased education impacts women's likelihood of having a say in whether to use contraception or not. According to the results, this likelihood increased by 13 percentage points in the treatment group. This result, similar to the assumption of Güneş (2016), is associated with women having greater decision-making freedom as a result of increased education.

Another subject of significant importance in the dynamics of women's empowerment is *domestic violence*. The impact of education on women's exposure to domestic violence and their attitudes towards it has been investigated by numerous studies (Erten & Keskin, 2018; Erten & Keskin, 2022; Akyol & Kırdar, 2022; Gulesci et al., 2020; Abdurrahimov & Akyol, 2018; Özer et al., 2023).

Erten and Keskin's (2018) primary objective is to explore the effect of the increased mandatory schooling duration resulting from the 1997 CSL on the prevalence of domestic violence using an RDD estimation strategy. Initially, the study identified an average increase of 1 to 1.5 years in women's education due to the reform. In this regard, Erten and Keskin (2018) utilized some data from the 2008 Turkey's National Survey on Domestic Violence against Women (NS-DVW) to make various inferences about domestic violence. According to the findings, the reform has an adverse effect on

the psychological violence behaviors experienced by women living in rural areas. However, they found no significant impact on physical and sexual violence against women. Similarly, no statistically significant effect was detected on attitudes toward domestic violence (Erten & Keskin, 2018). In another study by Erten and Keskin (2021), the impact of the increased duration of education resulting from the reform on women's awareness of laws related to gender equality and domestic violence was investigated. In this context, the outcomes of domestic violence were particularly examined. According to the findings of the study, education enhanced women's legal knowledge concerning laws on inequality and violence. However, it was determined that this increased awareness did not lead to significant changes in domestic violence outcomes. Specifically, no evidence was found of a reform effect on behaviors of physical, sexual, or psychological violence perpetrated by intimate partners (Erten & Keskin, 2021).

Another study conducted by Akyol and Kırdar (2022) utilized the NS-DVW surveys from 2008 and 2014, employing the RDD method. The primary aim of their study was to investigate how the extended schooling durations for both men and women as a result of the reform affected domestic violence against women. According to the findings of this study, the policy definitively reduced physical violence against women in rural areas (Akyol & Kırdar, 2022). Contrary to the findings by Erten and Keskin (2018), no effect of the policy on psychological violence was detected. However, it was concluded that the policy created a protective effect against domestic violence within households. Another study utilizing data from the years 2008 and 2014 was conducted by Abdurrahimov and Akyol (2018). This study also found, similar to the results of Akyol and Kırdar (2022), that the reform was effective in reducing domestic violence.

Some research on domestic violence has indicated that increased education results in changes in the characteristics of chosen partners and leads to *assortative matching* (Akyol & Kırdar, 2022; Özer et al., 2022). As discussed in Section 1.2, assortative matching is one of the significant dynamics between education and empowerment, and it describes the tendency of more educated women to form relationships with more educated men (Le & Nguyen, 2020; Siow, 2015). Regarding altered partner

characteristics, Akyol and Kırdar (2022) noted that the policy increased the education levels of women's partners. Additionally, they found evidence that the age gap between partners decreased for rural samples. Contrary to these findings, Erten and Keskin (2018) found no evidence that the reform had any effect on partner characteristics. Approaching the subject from a different perspective, Özer et al. (2022) investigated the impact of the reform through men's education, analyzing attitudes toward violence against women. According to the results of this analysis, increasing men's education was found to reduce incidents of physical, emotional, and economic domestic violence (Özer et al., 2022). It was also noted that this reduction could contribute to assortative matching, suggesting a bilateral decrease in domestic violence.

Another significant dynamic extensively studied in the literature on education and women's empowerment is women's *labor force participation*. Erten and Keskin (2018) discuss the implications of the policy on women's labor market outcomes, noting its positive effects. They found that an additional year of education increases the likelihood of women being employed by 1.3 percent (Erten & Keskin, 2018). Additionally, they identified a negative correlation between years of education and working in the agricultural sector. For women living in rural areas, who were most affected by the reform, the increase in the likelihood of employment was determined to be 8.2 percentage points (Erten & Keskin, 2018). However, the empirical evidence on this topic in the literature is somewhat more varied compared to other topics. For instance, contrary to Erten and Keskin (2018), Gulesci and Meyersson (2012) found no evidence of any impact of the reform on women's labor market participation. According to another finding, Akyol and Kırdar (2020) have noted that for urban areas, although statistically insignificant, the policy impact on employment is positive and large in magnitude. Despite contradictory findings, Tunali et al. (2019) have noted that, when characteristics such as age are held constant, labor force participation rates significantly increase as educational attainment rises. It has been stated that the policy change positively affected new generations and moved women to a more advantageous position regarding labor market participation (Tunali et al., 2019).

As evidenced by the literature review, particularly in Turkey and other developing countries, research in this area encompasses a variety of dynamics. Measuring the impact of significant structural changes, such as educational reform, contributes both to assessing the current status of women in society and to developing strategies aimed at further improving their conditions. The literature review reveals that studies examining the impact of increased education duration on women's empowerment, especially in developing countries and Turkey, employ various methodologies and focus on different dimensions of empowerment. Common findings suggest that extending compulsory education reduces the likelihood of early marriage, delays childbirth, and increases the use of contraceptive methods. Additionally, while some studies indicate that education reduces domestic violence and enhances decision-making power, others highlight mixed results, particularly regarding labor market participation. The research underscores that educational reforms have far-reaching implications, not only improving the immediate economic, social, and political empowerment of women but also influencing broader societal attitudes. This comprehensive analysis of empirical studies highlights the multifaceted benefits of education on women's empowerment, emphasizing the need for context-specific policies to address the unique challenges in different regions.

In contrast to existing studies, my research explains the causal impact of education on women's empowerment through an index that integrates various dynamics.

Additionally, I measured women's attitudes toward violence using a score variable. Adopting the Regression Discontinuity Design (RDD) methodology, my research design utilizes data from both the 2013 and 2018 Turkish Demographic and Health Surveys (TDHS). By measuring the impact of changes in the duration of education brought about by the 1997 reform on women's empowerment using two different datasets and two different dependent variables, I have created a distinct contribution compared to previous studies.

CHAPTER 3

RESEARCH DESIGN

3.1 DATA AND VARIABLES

3.1.1. Turkey Demographic and Health Survey (TDHS) Data

In this study, I utilized data from the 2013 and 2018 iterations of the TDHS, which are administered by the Hacettepe University Institute of Population Studies (HUIPS). The TDHS forms part of the global Demographic and Health Surveys (DHS) program and has been conducted every five years since its inception in 1968 (HUIPS, 2014). These surveys have established a comprehensive series, providing valuable insights into demographic trends.

The findings from both the 2013 and 2018 Turkey Demographic and Health Surveys (TDHS-2013; TDHS-2018) facilitate analyses across the nation's five demographic regions (West, South, Central, North, and East), delineating urban and rural areas comprehensively. Furthermore, owing to the adequate sample size in both datasets, certain survey topics allow analysis at the level of 12 geographic regions (NUTS 1). In each of the surveys, the sample design was implemented using a weighted, multi-stage, and stratified cluster sampling approach (HUIPS, 2014; HUIPS, 2019).

In both TDHS-2013 and TDHS-2018, two distinct instruments were utilized: the Household Questionnaire and the Woman's Questionnaire. The Household Questionnaire was employed to enumerate all members of the selected households and to assess their socio-economic status. Basic information such as age, gender, educational level, and marital status was collected in this section. Based on this information, appropriate respondents for the Woman's Questionnaire were identified.

All women aged 15-49 who resided in or were present in the selected households before the interview were included as respondents for the Woman's Questionnaire.

The Woman's Questionnaires comprehensively examine a range of topics, from the marriage and work history of women to more nuanced areas such as their fertility preferences, birth history, nutrition, child care, social status, migration, and husband's background history. Moreover, surveys provide insights into aspects of women's empowerment; women's employment, participation in decision-making, attitude towards wife beating, and interspousal differences. The samples include both ever-married and never-married women.

The TDHS-2013 has been conducted between September 2013 and January 2014, with participation from 11,794 households. The number of women aged 15-49 who participated in the survey was 9,746. In this questionnaire, almost half of the women interviewed were younger than 30, and 68% were married (HUIPS, 2014)

The TDHS-2018 has been conducted between October 2018 and February 2019. The number of households that participated in the survey was 11,056. Within these households, interviews were completed with 7,346 women aged 15-49. In this survey, it was indicated that 44% of women were under the age of 30, and 66% were married (HUIPS, 2019).

The primary target population of the research comprises women of reproductive age (15-49 years), with many questions in the surveys aimed specifically at ever-married women to investigate women's empowerment (Ewerling et al., 2017). Women who live with a partner and those who have lived with a partner but are now separated are considered ever-married (Croft et al., 2018). Correspondingly, focusing on the sample of currently-married women in DHS surveys provides a better reflection of current demographic and health trends, while offering more accurate and consistent data on fertility, family planning, and decision-making (Tesfa et al., 2022; Ewerling et al. 2017; Phan, 2016; Kitila et al., 2016; Samarakoon & Parinduri, 2015). Therefore, I included marital characteristics in the index I developed as an indicator of women's

empowerment to ensure a more consistent analysis. Furthermore, I presented the results of my research design on the ever-married sample in the robustness analysis section for comparative purposes.

The DHS and TDHS surveys are extensively utilized in the literature due to their comprehensive demographic information. Compared to other surveys with national representativeness, THDH data offers extensive details regarding individuals' fundamental population characteristics (Baltagi et al. 2019). The TDHS data has been employed in this thesis because it encompasses vital details such as the respondent's year of birth, their educational backgrounds, and numerous dynamics previously used in the current literature to measure women's empowerment. Additionally, as noted in 2.3. Studies Conducted for Turkey, TDHS data have been frequently cited in many significant studies within the realm of women's empowerment in Turkey.

The surveys are purposeful to observe the effect of the 1997 Compulsory Schooling Law on women's empowerment in Turkey. The TDHS collects detailed information about the educational backgrounds of all individuals residing in visited households, in addition to their demographic information (Kirdar et al. 2009). Accordingly, this data source provides the opportunity to analyze the changes occurring in educational levels in Turkey (Kirdar et al. 2016). Furthermore, another advantage of the TDHS for this study is the availability of respondents' birth year and month data (Aydemir et al., 2022). The information on respondents' month of birth is crucial for the estimation method I have chosen to use.

3.1.2. Measurement of Women's Empowerment

The measurement of women's empowerment presents itself as a complex subject in academic discourse. In the literature, Malhotra and Schuler (2005) have dissected the challenges associated with measuring women's empowerment into five primary reasons. These five measurement issues are categorized as multidimensionality, levels of aggregation, the importance of context, the infrequency of strategic life choices, and difficulties in measuring a process (Malhotra & Schuler, 2005).

In a similar vein, measurement challenges have been categorized and examined under three distinct headings. Firstly, there is the inherent multidimensionality of the concept; secondly, the dynamic and process-oriented nature of women's empowerment; and thirdly, the concept operates at various levels (Do & Kurimoto, 2012).

As I have mentioned in previous sections, the concept of women's empowerment possesses a multidimensional structure. This multidimensionality presents certain challenges in the measurement of women's empowerment, as the indicators are analyzed in various ways (Pratley, 2016). Up to the present, a multitude of studies have predominantly undertaken the measurement of this phenomenon by meticulously observing variables such as education, employment, and knowledge (Do & Kurimoto, 2012). These variables are commonly viewed as proxies for empowerment, playing a role in the measurement mechanism to define women's autonomy and status (Kishor & Subaiya, 2005). Specifically, education is regarded as a primary indicator of women's status (Al Riyami et al., 2004).

Moreover, approaches such as capturing empowerment through evidence have also gained widespread acceptance, with this evidence-based measurement evaluated as women's participation in household decision-making processes (Kishor & Subaiya, 2005). In addition to participation in decision-making processes, women's freedom of movement has also been incorporated as an indicator related to empowerment (Al Riyami et al., 2004). Nevertheless, the empirical observation of women's decision-making capabilities within households presents significant obstacles. The ability to make decisions can be examined only up to a certain threshold, given that the motivations and objectives behind these decisions are not discernible (Mahmud et al. 2012).

Malhotra et al. have synthesized and summarized in a table within their article the most commonly used dimensions of women's empowerment in the literature. As a result of this synthesis, six fundamental dimensions are delineated: economic, sociocultural, familial/interpersonal, legal, political, and psychological (Malhotra et al. 2002). In this study, utilizing the TDHS data as permitted, only three dimensions identified by

Malhotra et al. (2002)—economic, sociocultural, and familial/interpersonal—have been investigated. As no indicators are available for the other dimensions, they will not be discussed further.

The first critical dimension is economic empowerment. The participation of women in the workforce is often evaluated within this dynamic. Women's control over income, access to resources, and asset ownership emerge as topics within this dynamics (Malhotra et al. 2002). Additionally, issues such as the reduction of poverty, access to credit, remunerated work, and sustainable development are also examined under this dimension (Mujahid et al., 2015).

The second significant dimension is socio-cultural empowerment. Dividing this section into two parts, social and cultural empowerment, and briefly evaluating each will be more elucidative. Social empowerment, in its broadest definition, refers to the ability of women to participate as individuals within society, including in cultural and religious practices (Reshi & Sudha, 2022). On the other hand, when establishing indicators for measuring cultural empowerment, the cultural characteristics of the sample population under study are of significant importance. Kabeer contends that in studies investigating women's empowerment, insider values are particularly addressed through indicators measuring cultural context. It is noted that variations in cultural context influence women's agency, access to resources, and achievements (Kabeer, 1999). On the other hand, from a narrower perspective, cultural empowerment is characterized as women's ability to access cultural and artistic activities (Reshi & Sudha, 2022). To summarize, under the socio-cultural dimension, issues such as women's freedom of movement, participation in extra-familial social networks, women's literacy, patriarchal norms, and gender discrimination are evaluated (Malhotra et al. 2002).

The third dimension frequently referenced is familial/interpersonal empowerment. In the broadest sense, this area examines women's participation in decision-making processes within the family. The ability to make the childbearing decision, contraceptive use, control over spouse selection, marriage timing, and freedom from domestic violence are subsumed under this dimension (Malhotra, 2002). The

significance of familial/interpersonal empowerment should be emphasized both at the individual and societal levels. Considering the family as the fundamental unit of society, the empowerment of women must also be addressed by evaluating the dynamics within the family characteristics (Batool et al. 2019). With the increasing role in decision-making processes within the home, it is expected that there will be improvements in women's control over resources, their self-esteem, their autonomy, and the power dynamics within the family. This situation is expected to contribute positively to the well-being of both themselves and their child (Parveen & Leonhauser, 2005).

Another significant challenge encountered in measuring women's empowerment is the dynamic nature of the subject. Empowerment is frequently conceptualized as a process in the literature, which poses challenges for measuring evolving targets within this process using empirical tools (Vijayamohanan & Asalatha, 2012). Malhotra and Schuler (2005) assert that the optimal approach for apprehending a process entails monitoring its evolution at a minimum of two distinct temporal junctures. They further elucidate that the extent of the time frame required to measure the process may be contingent upon the dimension of empowerment or the socio-economic dynamics involved (Malhotra & Schuler, 2005).

Despite all the challenges, numerous studies have been conducted in this field to date, and various measurement methods have been proposed. The acknowledgment of empowerment as both a process and a multidimensional concept has not impeded studies on this subject; rather, it has expanded the diversity of analytical methods. As previously highlighted, the TDHS data, given its numerous advantages, effectively facilitates the measurement of this multidimensional and process-oriented issue.

3.1.2.1. Women's Empowerment Index

It is not feasible to explain women's empowerment solely using a single variable due to its multidimensional nature (Mitra & Kundu, 2012). Therefore, creating a multivariate structure like an index to measure empowerment proves to be more elucidative. In the existing literature, numerous indices have been developed specifically for this topic.

In 1995, the United Nations Development Program (UNDP) developed two significant indices aimed at measuring women's empowerment: the Gender-related Development Index (GDI) and the Gender Empowerment Metric (GEM) (Engida, 2021). In response to escalating critiques, the UNDP elected to reevaluate and subsequently revise the existing indices, culminating in the introduction of the Gender Inequality Index (GII) as a novel evaluative tool by 2010 (Phan, 2016). The index is examined under three dimensions: labor market, empowerment, and reproductive health. Despite the expectation that it would be a more effective indicator compared to the previous two indices, it remains limited by similar issues due to the lack of available data (Phan, 2016).

Another notable global indicator within this domain is the Global Gender Gap Index (GGI), which was developed by the World Economic Forum in 2006. The GGI annually assesses the current status of gender inequality across four fundamental dimensions: economic participation and opportunity, educational attainment, health and survival, and political empowerment (Global Gender Gap Report, 2023). According to the Global Gender Gap Report (2023), Turkey ranks 129th out of 146 countries with a GGI score of 0.638. In terms of labor force participation, Turkey is ranked 133rd, and in terms of educational attainment, it is ranked 99th. Additionally, according to the regional analyses of the report, Turkey is assessed within the Eurasia and Central Asia region and ranks significantly low among the countries in the region in terms of gender parity score (Global Gender Gap Report, 2023).

The Social Institutions and Gender Index (SIGI), developed by the Organisation for Economic Co-operation and Development (OECD), represents a significant indicator concerning gender inequality and the empowerment of women. This indicator measures discriminatory social institutions that restrict women's and girl's access to opportunities, resources, and power (Ferrant, 2014).

As previously mentioned, within the Sustainable Development Goals (SDGs) ratified by the United Nations (UN) General Assembly in 2015, *Goal 5* specifically addresses gender equality and the empowerment of women (United Nations, n.d.). Empowering women is pivotal for achieving sustainable economic growth, social progress, and

environmental sustainability, underscoring that without gender equality, sustainable development remains unattainable (Pathania, 2017). Additionally, the presence of a specific SDG on this subject highlights the significant importance of this issue and emphasizes the necessity for a cross-cultural standardized indicator to monitor the empowerment of women (Ewerling et al. 2017).

Consequently, studies in this field are evolving and expanding with each successive day. In this section, I have presented indicators that attempt to describe women's empowerment on a global scale. In the subsequent section, I will address indices of women's empowerment developed through Demographic Health Surveys.

3.1.2.2. Women's Empowerment Indices Developed Utilizing the Demographic and Health Survey (DHS)

DHS data are advantageous for the creation of multivariable constructs and indices aimed at monitoring women's empowerment due to the detailed information they contain about women. As mentioned in Chapter 2, numerous studies in this area utilize DHS data, particularly in developing countries. The same holds for studies conducted in Turkey using the TDHS.

An important index that measures women's empowerment using DHS data is the Survey-based Women's Empowerment Index (SWPER), developed by Ewerling et. al. (2017). In this study, an individual-level indicator for African countries has been developed in light of DHS data. The research underscores the utilization of DHS data primarily due to their high comparability and their importance as a significant public resource, particularly for low- and middle-income countries (Ewerling et al. 2017). 34 countries were selected, and principle component analysis was conducted on a combined dataset to obtain a valid empowerment indicator applicable to all the selected countries. The components derived from the analysis represented three fundamental dimensions of empowerment, which were titled: "*attitude to violence*", "*social independence*", and "*decision-making*" (Ewerling et al., 2017).

The subsequent version of the study, titled "*SWPER Global*" aimed to expand the scope of the developed indicator to make inferences on a global scale (Ewerling et al. 2020). Unlike the previous study, the explanatory power of the index on a global scale has been evaluated. For this purpose, national health surveys from low- and middle-income countries in other regions of the world have been considered (Ewerling et al. 2020).

In another study utilizing DHS data, domains of women's empowerment were identified by analyzing survey data from multiple regions in Sub-Saharan Africa. Nineteen countries representing four regions of Africa have been included in the analysis, and a total of 26 indicators have been utilized. The research delineated four principal dimensions as findings: *attitude toward violence*, *work/labor force participation*, *education*, and *access to healthcare* (Asaolu et al 2018).

Another index developed in this field is the Female Empowerment Index (FEMI). This index aims to monitor multiple dimensions of women's empowerment at the sub-national level and track spatial and temporal variations (Rettig et al., 2020). In the research conducted with a focus on Nigeria, data from five DHSs between 1990 and 2013 were utilized. The FEMI is based on six fundamental women's empowerment categories: *violence against women*, *employment*, *education*, *reproductive healthcare*, *decision-making*, and *access to contraceptives* (Rettig et al., 2020).

As can be seen, indices created using DHS data display some components that exhibit similar or common characteristics. For example, *attitudes towards violence* is a category that is investigated in all three indices. Other categories, such as women's *labor force participation*, *reproductive preferences*, *household decision-making*, and *access to public services*, while not identical, show similarities due to the variables they contain. Numerous variables used in these indices are also present in the TDHS data. Consequently, an index of women's empowerment could be developed using the TDHS data by referencing the variables from these previously established indices.

3.1.3. Dependent Variables

In the existing literature, studies exploring the impact of increased education on women, using the 1997 reform that extended compulsory education by three years as an instrumental variable, have focused on specific dimensions (Erten & Keskin, 2018; Aydemir et al., 2022; Akyol & Kırdar, 2022; Kırdar et al. 2016). For example, these topics include domestic violence, age at marriage, age at first birth, participation in education, and participation in the labor market. In this study, I aim to elucidate the impact of the extended compulsory education period on women's empowerment by utilizing multiple variables available within the TDHS data. The two primary dependent variables used in the analysis and their descriptions are presented in Table 1.

Table 1: List of Dependent Variables and Their Definitions

DEPENDENT VARIABLES	VARIABLE DEFINITION
Women's Empowerment Index	An index was created using the TDHS data from 2013 and 2018. It has been developed through Principal Component Analysis (PCA) and ranges between 0 and 1.
Attitude Toward Violence Score	A score variable created using five indicators (V744A/B/C/D/E) within the TDHS 2013 and 2018 datasets that reflect respondent's attitudes toward violence.

As the first dependent variable, I constructed a women's empowerment index, referencing variables previously used in studies on women's empowerment (Ewerling et al., 2017; Ewerling et al., 2020; Asaolu et al., 2018). Due to the varying content of DHS data across countries, it was not possible to find the same variables in the TDHS data. Therefore, I directly used the identical variables, and for those that were not available, I selected similar variables to include in the analysis. With the help of factor analysis, I identified the explanatory power of the variables used in the index and the components they formed when combined. As a result, the opportunity to monitor the effects of

education on women's empowerment through a combination of various indicators has emerged.

In the following subsections, I provide a detailed explanation of the development stages of the two different dependent variables used in my analysis. Subsection 3.1.3.1 covers the construction of the women's empowerment index, while subsection 3.1.3.2 explains the score variable measuring attitudes toward domestic violence.

3.1.3.1. Construction of the Women's Empowerment Index (WEI)

I combined the indicators related to women's empowerment, previously used in earlier studies, from the 2013 and 2018 TDHS data to create an index for use as the first dependent variable in my analysis. To construct the index, I employed the Principal Component Analysis (PCA) method. The primary objective of PCA is to examine the relationships between the indicators, presenting the explanatory indicators and the optimal components (Richardson, 2009). This enabled me to analyze both how the variables I aim to use are grouped within the index and the extent to which each variable contributes to the index. Table 2 includes 14 different variables that have been used in previous studies to measure women's empowerment within an index and are also mentioned under the topic of women's empowerment in the 2018 TDHS report (Ewerling et al. 2017; Asaolu et al., 2018; TDHS, 2018).

Table 2: The Initial Components of the Women's Empowerment Index

#	Variable Names	Recoded Names	Variable Label	Categorization
FAMILIAL / INTERPERSONAL DOMAIN				
1.	V511	d_V511	Age at first cohabitation	Code 0 if <18 Code 1 if ≥18
2.	V302	d_V302	Contraceptive Using	Code 1 if 3 Code 0 otherwise
3.	V217	d_V217	Knowledge of ovulatory cycle	Code 1 if 3 Code 0 otherwise
4.	S793E/S796E	internet	Use of internet	Code 0 if 0 Code 1 if 1 or 2
ASSET OWNERSHIP DOMAIN				
5.	V745A	d_V745A	House ownership	Code 1 if 1 or 2 Code 0 otherwise
6.	V745B	d_V745B	Land ownership	Code 1 if 1 or 2 Code 0 otherwise
GENDER ROLE ATTITUDES DOMAIN				
7.	S791A/S794A	opinA	Opinion: family decision by men	Code 0 if 1 or 8 Code 1 if 0
8.	S791B/S794B	opinB	Opinion: husband should do housework	Code 0 if 1 or 8 Code 1 if 0
9.	S791C/S794C	opinC	Opinion: educated son better than daughter	Code 0 if 1 or 8 Code 1 if 0
10.	S791D/S794D	opinD	Opinion: women should not work	Code 0 if 1 or 8 Code 1 if 0
11.	S791E/S794E	opinE	Opinion: more women politician	Code 0 if 1 or 8 Code 1 if 0
ECONOMIC DOMAIN				
12.	Own calculation	workin12m	Respondent worked in last 12 month	Code 0 if 0 Code 1 if 1
13.	S788/S793	havemoney	Have money to spend	Code 0 if 0 Code 1 if 1
14.	S795G/S797G	house_shop	Housework: shopping for the kitchen	Code 1 if 10,11 and 12 Code 0 otherwise

Initially, I categorized these 14 variables under four empowerment headings—*Familial/Interpersonal, Asset Ownership, Gender Role Attitudes, and Economic*—to align with the literature. Using these variables, I conducted a PCA to measure the relationships between the variables and their contributions to the new variable to be created for explaining women's empowerment. The results of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test from the PCA of the initial variables are presented in Table 3.

Table 3: KMO and Bartlett's Test for the Initial PCA

Bartlett's Test of Sphericity	Chi-square	25815.594
	Degrees of Freedom	91
	P-Value	0.000
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)		0.776

After the initial principal component analysis, the result of the KMO test was found to be 0.776, as seen in Table 3. According to Shrestha (2021), the primary purpose of the KMO test is to measure the suitability of the variables for PCA, and the test result ranges between 0 and 1. A value less than 0.6 indicates that the sample is not adequate, while values of 0.7 and above indicate moderate to high adequacy (Shrestha, 2021). In light of this information, as the KMO value increases, the explanatory power of the sample also increases. Thus, the results of my initial analysis, with a KMO value of 0.776, demonstrate sufficient explanatory power. Another indicator, Bartlett's test, assesses the equality of variances in the sample, and its significance is crucial for explanatory power (Arsham & Lovric, 2011). As seen in Table 3, the result of Bartlett's test in the initial analysis was also significant.

Based on the initial PCA results, I eliminated the variables with very low explanatory power. The final list of variables used after the elimination is shown in Table 4. The results of the KMO and Bartlett's tests from the PCA analysis conducted on the selected final variables are presented in Table 5. According to the final PCA results, the KMO test value increased to 0.780, and this higher KMO value indicates better explanatory power (Shrestha, 2021). The result of Bartlett's test was again significant, and the reduction of the degrees of freedom to 36 also demonstrates that the model has better significance compared to the initial PCA results.

Table 4: The Final Components of the Women's Empowerment Index

#	Variable Names	Recoded Names	Variable Label	Categorization
GENDER ROLE ATTITUDES DOMAIN				
1.	S791A/S794A	opinA	Opinion: family decision by men	Code 0 if 1 or 8 Code 1 if 0
2.	S791B/S794B	opinB	Opinion: husband should do housework	Code 0 if 1 or 8 Code 1 if 0
3.	S791C/S794C	opinC	Opinion: educated son better than daughter	Code 0 if 1 or 8 Code 1 if 0
4.	S791D/S794D	opinD	Opinion: women should not work	Code 0 if 1 or 8 Code 1 if 0
SOCIO-ECONOMIC DOMAIN				
5.	V511	d_V511	Age at first cohabitation	Code 0 if <18 Code 1 if >=18
6.	V217	d_V217	Knowledge of ovulatory cycle	Code 1 if 3 Code 0 otherwise
7.	S793E/S796E	internet	Use of internet	Code 0 if 0 Code 1 if 1 or 2
8.	Own calculation	workin12m	Respondent worked in last 12 month	Code 0 if 0 Code 1 if 1
9.	S788/S793	havemoney	Have money to spend	Code 0 if 0 Code 1 if 1

Table 5: KMO and Bartlett's Test for the Final PCA

Bartlett's Test of Sphericity	Chi-square	23554.301
	Degrees of Freedom	36
	P-Value	0.000
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)		0.780

The eigenvalues of the components from the PCA analysis, conducted again using the final variables, are presented in Table 6. For the eigenvalues of the components to be considered significant and explanatory, they must be greater than 1 (Abdi & Williams, 2010). As seen in Table 6, according to the final PCA results, only two components have eigenvalues greater than 1. Therefore, I concluded that I should use the first two components in the index I created to measure women's empowerment. Additionally, the cumulative variance explained by the first two components with significant eigenvalues is 49%. In other words, these two components, constructed with the selected variables, explain 49% of women's empowerment.

Table 6: Total Variance Explained Table for the Final PCA

Component	Eigenvalue	Difference	Proportion	Cumulative
1	3.08982	1.74016	0.3433	0.3433
2	1.34966	.391375	0.1500	0.4933
3	.958285	.034837	0.1065	0.5998
4	.923448	.141624	0.1026	0.7024
5	.781824	.116294	0.0869	0.7892
6	.665531	.043300	0.0739	0.8632
7	.62223	.156839	0.0961	0.9323
8	.465391	.321579	0.0517	0.9840
9	.143812	.	0.0160	1.0000

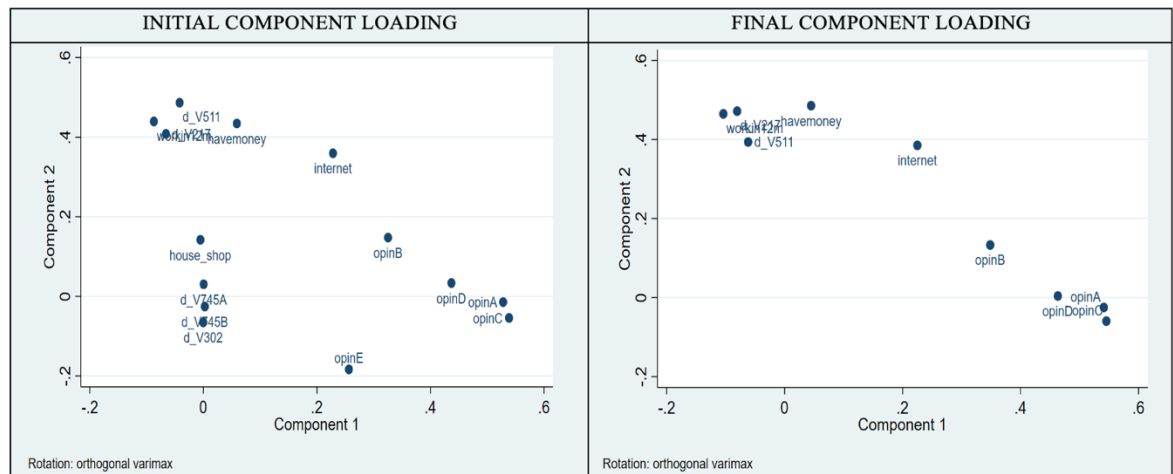
To optimize the clustering of components and facilitate interpretation, I applied orthogonal rotation (varimax) to both the initial and Final PCA values. As a result of the rotation, the Initial PCA results exhibited a considerable number of binary clusters. However, after the eliminations I performed for the Final PCA, the distribution of variables under the components became more meaningful. Table 7 presents the distribution of variables under the two significant components following the orthogonal rotation for the final PCA. This distribution resulted in variables related to *Gender Role Attitudes* clustering in the first component, and variables related to *Socio-Economic* factors clustering in the second component.

Table 7: Rotated Component Matrix Table for the Final PCA

	INDICATORS	Component 1 <i>Gender Role Attitudes</i>	Component 2 <i>Socio-economic</i>
1	Opinion: family decision by men	0.5411	- 0.0249
2	Opinion: husband should do housework	0.3484	0.1331
3	Opinion: educated son better than daughter	0.5454	- 0.0594
4	Opinion: women should not work	0.4632	0.0040
5	Age at first cohabitation	- 0.0619	0.3938
6	Knowledge of ovulatory cycle	- 0.0805	0.4718
7	Use of internet	0.2249	0.3853
8	Respondent worked in last 12 month	- 0.1040	0.4649
9	Have money to spend	0.0448	0.4856

According to the initial and final PCA results, the explanatory power of the variables for the two components is visualized in Figure 1.

Figure 1: Initial and Final Component Loadings



As a result, two components were selected for use in the women's empowerment index, and the variables were categorized under these two components in a meaningful and interpretable manner following the rotation. The final state of the two components and their variables is shown in Table 8.

Table 8: Final Component List

Gender Role Attitudes Component	Socio-Economic Component
Opinion: family decision by men	Age at first cohabitation
Opinion: husband should do housework	Knowledge of ovulatory cycle
Opinion: educated son better than daughter	Use of internet
Opinion: women should not work	Respondent worked in last 12 month
	Have money to spend

To construct the index, I first standardized the two selected components separately. As noted by DiStefano et al. (2019), there are various methods for creating an index using different components. Given the significant difference in eigenvalues of the two components I used, I opted to weight them according to their eigenvalues rather than using an arithmetic mean with equal weighting. This approach, recommended by DiStefano et al. (2019), is expected to yield more accurate outcomes in terms of the index's explanatory power compared to equal weighting of the components. Therefore, each component in the constructed index is weighted according to its eigenvalue. As a result of all these analyses, I have constructed an index capable of measuring women's

empowerment through both attitudes towards gender roles and socio-economic factors. Additionally, it has become possible to examine these two components independently of the index. This allows for the analysis of both the impact of education on attitudes toward gender roles and the effects of socio-economic factors on women's empowerment. Statistics related to the index and these two separate components are presented in Section 3.1.6.

3.1.3.2. Construction of the Attitudes Toward Domestic Violence Score Variable

As the second dependent variable, I utilized the five indicators shown in Table 9, which are commonly found in multivariate indicators previously created with DHS data and measure women's attitudes toward domestic violence. These variables are present in both DHS and TDHS data.

Table 9: Attitude Toward Domestic Violence Variables

Variable Names (Original)	Recoded Names	Variable Label
V744A	beatA	Beating justified if wife goes out without telling husband
V744B	beatB	Beating justified if wife neglects the children
V744C	beatC	Beating justified if wife argues with husband
V744D	beatD	Beating justified if wife refuses to have sex with husband
V744E	beatE	Beating justified if wife burns the food

The original variables presented in Table 9, excluding missing values, had three possible responses: "No", "Yes" and "Don't Know" coded as 0, 1, and 8, respectively. To analyze changes in women's attitudes toward violence, I recoded these variables into categorical variables with values of 0 and 1. In the recoded variables, a response of "Yes" indicating that beating women is justified, was assigned a value of "0" for all five different situations. Similarly, a response of "Don't Know" was also assigned a value of "0". Women who responded "No" indicating that violence against women is not justified, were assigned a value of "1" for all five situations. This method of recording, aimed at measuring women's attitudes toward violence, has also been used by Ewerling et al. (2017).

Using these newly created categorical variables, I developed a score variable to measure women's attitudes toward violence. In the process of creating the score variable, I assigned equal weights to each variable and summed them. I named this new score variable the "*Attitude Toward Domestic Violence Score Variable*" and included it as a second dependent variable in my analysis. Table 10 presents the statistics related to the score variable I developed.

Tablo 10: Attitude Toward Domestic Violence Score Variable Statistics

Beating Not Justified Score	Frequency	Percent (%)
0	57	0.49
.2	102	0.87
.4	223	1.91
.6	407	3.48
.8	982	8.40
1	9,916	84.85
TOTAL	11,687	100.00

As seen from the statistics in Table 10, only 57 women justified beating in all five situations, whereas 9,916 women did not justify it in any situation. The results of my analysis on whether there is any policy effect on these attitudes are presented in the next chapter.

3.1.4. Independent Variables

This section of the study provides information about the independent variables used. Fundamentally, two independent variables describe respondents' exposure to the reform. Table 11 presents the primary independent variables used in my analysis and their descriptions. The first is the *policy dummy variable*, which indicates whether individuals were affected by the 1997 reform. As previously mentioned, there are uncertainties regarding whether individuals born in 1986 were impacted by the policy; hence, individuals born in that year have not been included in the analysis. According to

the policy dummy variable, individuals born from January 1987 to January 1992 are included in the treatment group and are assigned a value of “1,” while individuals born from December 1985 to December 1980 are included in the control group and are assigned a value of “0.” In the literature, similar studies employing a similarly coded policy dummy variable have been conducted by Erten and Keskin (2022), Aydemir et al. (2022), and Gulesci et al. (2020). The analysis is restricted to birth cohorts within 60 months on either side of the cutoff, and the main analysis focuses on individuals within this 5-year bandwidth.

Another independent variable used is the *centered running variable*, which describes respondents' month-year of birth. In an RD design, the running variable plays a significant role in distinguishing between groups affected and unaffected by the policy, as it references the cutoff point (Lee & Lemieux, 2010). In this thesis, I used the month-year of birth as the running variable because it is a continuous variable that facilitates the observation of the 1997 CSL applied to all respondents in the treatment group. According to the running variable I created, the year 1986 is assigned a value of 0 and defines the cutoff point. The treatment group is defined sequentially from January 1987, which is assigned a value of 1, to January 1992, which is assigned a value of 60. Conversely, the control group is defined sequentially from December 1985, which is assigned a value of -1, to December 1980, which is assigned a value of -60. Thus, all birth months between 1980 and 1992 are defined with 1986 as the center cutoff point. Consequently, the 60 months before and after 1986 are included as the centered running variable for the main analysis with a 5 month-year bandwidth.

Table 11: List of Independent Variables and Their Definitions

INDEPENDENT VARIABLES	VARIABLE DEFINITION
Policy Variable	A dummy variable indicates whether the respondent is affected by the policy. If the respondent was born after January 1987, the variable takes the value of 1, and otherwise 0.
Centered Running Variable (Month-Year of Birth)	A variable that defines the respondents' month-year of birth. Respondents born in 1986 have not been included in the analysis. It delineates separate linear time trends around the cutoff point of the policy variable according to the month of birth.

3.1.4.1. Control Variables

This section provides detailed information on the control variables utilized in the analysis. The control variables used in my analysis have also been employed in previous studies by Aydemir et al. (2022), Erten and Keskin (2021), and Kirdar et al. (2009). The most important common characteristic of the selected control variables is that they represent conditions that cannot be affected by the 1997 reform. Accordingly, I included some regional, familial, and individual information about the respondents in the regression using these variables, thereby enhancing the explanatory power of the analyses.

The first control variable employed is the *birth region* variable, which describes the respondents' birthplace regions on a NUTS-1 basis. According to the NUTS-1 classification, socioeconomic regions in Turkey are analyzed under 12 different categories. The birth region variable also displays these twelve distinct regions and dummy variables are assigned based on the respondents' birth regions. Another control variable used in the analysis is the *childhood location of residence*. In the survey, information is categorized into three different location types: province center, district center, and sub-district/village. Similar to the birth region variable, this variable also represents the socioeconomic and demographic characteristics of the respondents.

Additionally, the variables *mother-literate*, *mother school attendance*, *respondent's month of birth*, and *age groups of respondents* have been included as control variables in the analysis. Similar variables were employed as control variables in RDD analysis by Aydemir et al. (2022). Although the mentioned study also utilized father-literate data, I was unable to include it as a control variable in the analysis because the 2018 data lacks information on father-literate.

3.1.5. Data Limitations

In this thesis, I previously discussed the primary motivations for using the TDHS to measure women's empowerment in Turkey. While the TDHS data offers certain

advantages in this regard, it also presents several limitations. For instance, due to data limitations, the empowerment status of never-married women could not be measured in this study. Ewerling et al. (2017) indicate that one of the fundamental limitations of the data is that most questions related to empowerment are specifically asked only of ever-married women. Alternatively, as Malhotra et al. (2002) also note, while such surveys have advanced efforts to measure empowerment, they predominantly focus on ever-married women, thus offering a perspective that largely views empowerment through the lens of marital relationships. Moreover, as Ewerling et al. (2017) note, the fact that not all questions are available in all surveys complicates the ability to make precise comparisons across countries, further highlighting the challenges associated with the data.

3.1.6. Descriptive Statistics

This subsection contains the descriptive statistics of the dependent, independent, and control variables used in the analysis. Additionally, I present detailed statistics regarding the regional and educational information of the respondents. In the analysis, I utilized month-year birth cohorts within 60-month bands around the cutoff point. Furthermore, I divided all summary statistics into treatment and control groups.

Table 12 not only presents the means and standard deviations for the dependent variables used in the analysis but also provides the means and standard deviations for the respondents' educational attainment, specifically the proportion of at least secondary school graduates, and other general information. Consequently, the average values and standard deviations for the primary variables used in my analysis are displayed for both the groups impacted by the reform (1987-1992) and those unaffected (1980-1985), within a 5-year time interval around the cutoff point.

Table 12: Descriptive Statistics - Mean Values and Standard Deviations of Variables

VARIABLES	OBSERVATION (N)	TREATMENT GROUP (1987 - 1992)		CONTROL GROUP (1980 – 1985)	
		μ	s	μ	s
Women’s Empowerment Index	3,444	0.403	0.231	0.393	0.226
Attitude Toward Violence Score	4,113	0.958	0.129	0.956	0.134
At Least Secondary School Completion	4,116	0.674	0.468	0.411	0.492
Education Years	4,116	8.104	4.330	7.238	4.435
Age	4,117	26	2.848	32	2.876
Year of Birth	4,117	1988	1.489	1982	1.427

In addition, to provide a detailed overview of the respondents' regional information, Table 13 displays the frequency and percentage distribution of region of birthplace, childhood location of residence, and place of residence. The region of birthplace statistics includes information on respondents according to 12 different NUTS-1 level regions. The childhood location of residence statistics presents the places where respondents lived until the age of 12, categorized into three groups: province center, district center, and village. Finally, Table 13 also shows the respondents' place of residence at the time of the survey, categorized into two types of settlements: rural and urban. The primary purpose of presenting these regional summary statistics is twofold: first, to conduct detailed regional analyses on women's empowerment in the robustness analysis section; and second, to use the region of birthplace and childhood location of residence variables as control variables in the main analysis.

Table 13: Descriptive Statistics – Regional Informations

VARIABLES	TREATMENT GROUP (1987-1992)		CONTROL GROUP (1980-1985)	
	Freq.	(%)	Freq.	(%)
Region of Birthplace (NUTS – 1)				
Istanbul	72	4.16	104	4.52
West Marmara	70	4.04	109	4.74
Aegean	112	6.47	152	6.61
East Marmara	68	3.93	110	4.78
West Anatolia	98	5.66	161	7.00
Mediterranean	225	12.99	277	12.04
Central Anatolia	165	9.53	214	9.30
West Black Sea	160	9.24	260	11.30
East Black Sea	131	7.56	188	8.17
Northeast Anatolia	186	10.74	250	10.86
Central East Anatolia	167	9.64	198	8.60
Southeast Anatolia	278	16.05	278	12.08
TOTAL	1,732	100.00	2,301	100.00
Childhood Location of Residence (Province Center / District Center / Village)				
Province Center	533	30.49	764	32.93
District Center	488	27.92	612	26.38
Sub-District / Village	727	51.59	944	40.69
TOTAL	1,748	100.00	2,320	100.00
Place of Residence (Urban / Rural)				
Rural	1,280	72.40	1,824	77.65
Urban	488	27.60	525	22.35
TOTAL	1,768	100.00	2,349	100.00

Finally, in Table 14, I present the descriptive statistics regarding the respondents' educational information. To detail the educational information, I provided the frequency and percentage distribution for educational attainment and education in single years, separated into treatment and control groups. Educational attainment is shown in four categories: no education, completion of at least primary school, completion of at least secondary school, and completion of at least high school. The education in single years

data includes statistics on the highest number of years of education completed by the respondents.

As can be seen from the distributions in Table 14, the most significant percentage difference between the treatment and control groups in terms of educational attainment is in the completion of at least middle school. Moreover, in the education in single years data, the percentage changes in specific years between the treatment and control groups are notable. In the control group, which was not exposed to the reform and had a compulsory education duration of five years, the 5th year shows the highest percentage. In the treatment group, exposed to the reform that extended compulsory education to eight years, the 8th year had the highest percentage of completion. Thus, the impact of the reform on women's educational outcomes is evident from the summary statistics in Table 14. The primary purpose of presenting the detailed summary statistics of respondents' educational information is to illustrate the impact of the reform on educational outcomes for the sample used in my analysis.

Tablo 14: Descriptive Statistics – Detailed Educational Information

VARIABLES	TREATMENT GROUP (1987-1992)		CONTROL GROUP (1980-1985)	
	Freq.	(%)	Freq.	(%)
	Educational Attainment			
No Education	181	10.24	228	9.71
At Least Primary School Completed	1,478	83.60	2,008	85.48
At Least Secondary School Completed	1,192	67.42	966	41.14
At Least High School Completed	616	34.84	749	31.90
Education in Single Years				
0	181	10.24	228	9.71
1	21	1.19	9	0.38
2	20	1.13	34	1.45
3	28	1.58	44	1.87
4	40	2.26	26	1.11
5	251	14.20	989	42.12
6	16	0.90	26	1.11
7	19	1.07	26	1.11
8	507	28.68	176	7.50
9	45	2.55	28	1.19
10	24	1.36	13	0.55
11	272	15.38	351	14.95
12	73	4.13	49	2.09
13	71	4.02	85	3.62
14	29	1.64	15	0.64
15	106	6.00	188	8.01
16	56	3.17	29	1.24
17	6	0.34	24	1.02
18	3	0.17	4	0.17
20	-	-	2	0.09
21	-	-	2	0.09
TOTAL	1,768	100,00	2,348	100,00

3.2. METHODOLOGY

In this thesis, I used the Regression Discontinuity Design (RDD) as the estimation method. This research method has also been preferred in many studies seeking empirical answers to similar research questions in the literature (Sahue, 2019; Samarakoon & Parinduri, 2014; Nguyen-Phung & Nthenya, 2023; Gulesci & Meyersson, 2012; Kirdar et al., 2016; Erten & Keskin, 2021; Akyol & Kirdar, 2022; Aydemir et al. 2022). Compared to the Ordinary Least Squares (OLS) method, RDD has several notable advantages. According to Wooldridge (2010), estimating the effects of education using the OLS method often results in biased and inconsistent outcomes for several reasons. First, there may be unobserved heterogeneity; factors that affect both the likelihood of receiving education and the outcome of interest, which are not accounted for in the model. This endogeneity issue leads to omitted variable bias (Angrist & Pischke, 2008). Second, there may be measurement errors or reverse causality, where the outcome influences educational attainment rather than the other way around (Stock & Watson, 2015). Lastly, selection bias can occur if individuals self-select into education based on characteristics that also affect the outcome, resulting in an overestimation or underestimation of the true effect (Cameron & Trivedi, 2005).

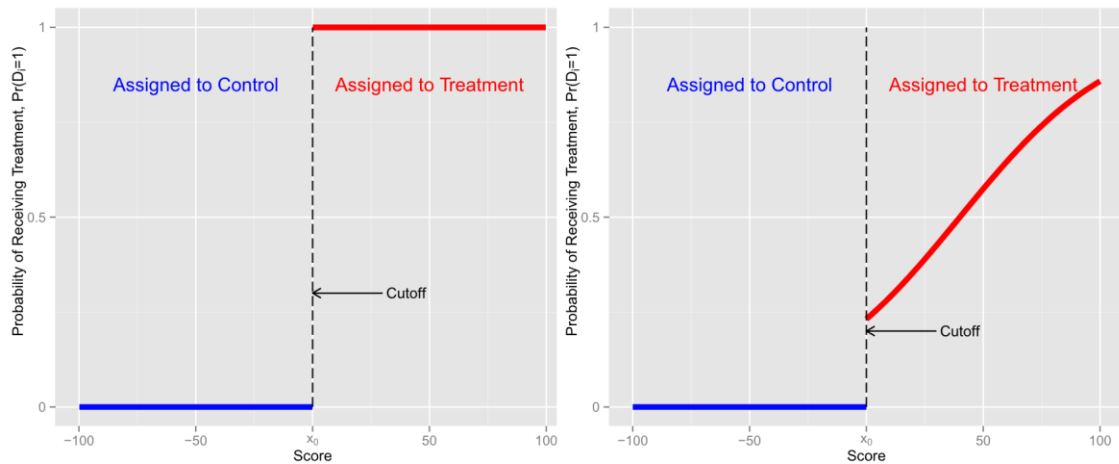
RDD helps solve these estimation problems by using a natural cutoff point to assign individuals to treatment and control groups in an almost random manner (Lee & Lemieux, 2010). According to Imbens and Lemieux (2008), this design mimics a randomized experiment around the cutoff, where individuals just above and below the threshold are assumed to be similar in all respects except for the treatment. By comparing these groups, RDD provides a local average treatment effect that is unbiased and consistent, assuming there are no other discontinuities at the cutoff and the assignment mechanism is random (Angrist & Pischke, 2008). Therefore, the Regression Discontinuity Design (RDD) helps to mitigate issues such as endogeneity and omitted variable bias, which often affect OLS estimates. This approach provides more reliable and credible estimates of the causal effect of education. Consequently, due to all the reasons mentioned and its frequent use in the literature, I chose to employ the RDD method.

3.2.1 Regression Discontinuity Design (RDD)

This study analyzes the effect of the 1997 Compulsory Schooling Law on empowering women in Turkey using the *Regression Discontinuity Design (RDD)*. The RDD is one of the best methods to study quasi-experimental events such as the 1997 education reform. This method was first introduced by Donald Thistlethwaite and Donald Campell in 1960 to analyze the impact of merit awards on the future academic outcomes of students (Thistlethwaite & Campbell, 1960). The popularity of RDD has grown markedly since the 1990s. It has been employed with considerable prominence in recent scholarly endeavors within the realm of economics (Sun & Pan, 2013). The design method has been employed to estimate various program effects across a multitude of economic contexts.

The RDD is a robust non-experimental method for estimating causal effects, defined by three core elements: score, cutoff, and treatment (Cattaneo et al., 2019). Units receive treatment based on whether a covariate exceeds a specified cutoff, such as the 1997 CSL used in this analysis (Calonico et al., 2014). Visualizations in RDD can clearly show if there's a substantial treatment effect, indicated by a discontinuity at the cutoff in the regression curve (Lee & Lemieux, 2010). This method allows for clear identification and representation of the impacts of educational reforms. There are two types *sharp* and *fuzzy*, and the method is determined according to the sharpness of the effect on the treatment group. In a Sharp RD design, assignment to treatment conditions is determined solely by a cutoff point. If the assignment to the treatment group is also influenced by factors other than the cutoff point, the allocation becomes imprecise, and a Fuzzy RD design is preferred (Sun & Pan, 2013).

Figure 2: Probability of Receiving Treatment in Sharp and Fuzzy RDD method



Source: Skovron & Titiunik (2015)

Figure 1 illustrates the conditional probability of inclusion in the treatment group within the sharp and fuzzy RDD methods. In this study, my analysis is predicated on the reality that individuals born in and after January 1987 were subjected to an increase in the duration of compulsory education from 5 to 8 years as a result of the reform (Kirdar et al., 2018). As mentioned in Section 1.3, it is challenging to definitively distinguish individuals affected by the policy due to various factors. The status of individuals born in 1986, in particular, regarding their influence by the policy is quite ambiguous (Kirdar et al., 2018; Gulesci & Meyersson, 2015). Nonetheless, it is acknowledged that those born in January 1987 or later are more likely to be influenced by the reform compared to those born in earlier years (Erten & Keskin, 2020; Cesur & Mocan, 2013; Aydemir et al., 2022; Kirdar et al., 2016). For all the reasons explained above, I employed the Fuzzy RDD method in my analysis.

3.2.2. Model Specification

Utilizing exposure to the 1997 reform as an instrumental variable is important in outlining the analytical methodology when examining the impact of education on women's empowerment and attitudes toward violence. Additionally, the variation among birth month-year cohorts in the TDHS data regarding exposure to the 1997 reform must also be considered (Aydemir et al., 2022). Therefore, I will employ a fuzzy

RDD design to estimate the impact of education on women's empowerment and attitudes towards violence. Using the fuzzy RDD approach, I have developed a two-stage least squares (2SLS) model applicable to both dependent variables. The 2SLS method is a statistical technique used to measure the causal effects of endogenous variables, in this case, education. The 2SLS method operates in two stages: first, the predicted at least secondary school completion status is estimated using the policy variable. Second, this predicted educational attainment is used to analyze the causal effect on the two dependent variables, namely the women's empowerment index and attitudes toward violence. This method aims to more accurately measure the causal effects of education on women by addressing potential reverse causality and biases.

The first stage of the analysis focuses on estimating the probability of at least secondary school completion for individuals, modeled by the 2SLS method. This stage, which shows the relationship between completing at least secondary school (SSC_{it}) and exposure to the reform (P_i), is presented in Equation 1.

$$SSC_{it} = \gamma_0 + \gamma_1 P_i + g(A_i, P_i) + Z_{it}' \xi + \epsilon_{it} \quad (1)$$

In Equation 1, I have modeled it as a function of a policy dummy variable (P_i) that takes the value of 1 for individuals born between January 1987 and January 1992, and 0 for those born between December 1985 and December 1980, leveraging the exogenous shift introduced by educational reforms as an instrumental variable. In the $g(A_i, P_i)$ term that defines the birth cohort, A_i measures the distance of the individual's birth cohort from the 1986 cut-off point. The vector of control variables Z_{it} encompasses the NUTS-1 region of birth, the type of childhood region (Province, District, Village), the mother's literacy status, and the mother's school attendance, alongside dummies for birth months and age groups.

In Equation 2, the second stage of the analysis examines the effect of at least secondary school completion on women's empowerment and attitude toward violence, denoted as Y_{it} :

$$Y_{it} = \delta_0 + \delta_1 SSC_{it} + f(A_i, P_i) + Z_{it}' \rho + \eta_{it} \quad (2)$$

In both Equation 1 and Equation 2, i denotes the individual, and t denotes the survey year. The outcome variable Y_{it} represents the estimation of respondents' empowerment or attitudes towards violence by integrating the predicted at least secondary school completion status SSC_{it} from the first stage of the model.

The 2SLS estimator δ_1 in Equation 2 measures the causal effect on empowerment and attitudes towards violence for women who changed their educational behavior to complete at least middle school due to exposure to the reform. This group is selected because they directly experience the impact of the reform, which allows for a clear understanding of the causal effects of the reform, and consequently education, on empowerment and attitudes toward violence. The importance of focusing on women who altered their educational behavior due to exposure to the reform lies in the fact that, without the reform, these women would likely have completed their education at the end of the compulsory schooling period, which was the 5th grade. As a result of the reform that extended compulsory education from 5 to 8 years, these women changed their educational behavior by receiving three additional years of schooling. This change in educational behavior, prompted by policy intervention, is particularly significant in the context of parents who, due to socio-economic and socio-cultural reasons, preferred to limit their daughters' education to the compulsory schooling period (Dursun et al., 2022). In other words, the reform may have enabled women, who had a lower likelihood of continuing their education due to economic and socio-cultural reasons, to pursue further education (Berker, 2023). Therefore, measuring empowerment and attitudes towards violence among women who changed their educational behavior due to the reform is crucial for the study's objective.

The term $f(A_i, P_i)$ defines the birth cohort like the Equation 1. Including $g(A_i, P_i)$ and $f(A_i, P_i)$ in both equations allows for variations in cohort trends before and after the cut-off point (Berker, 2023). In more explicit detail; $g(A_i, P_i) = g_1 A_i + g_2 P_i * A_i$ and $f(A_i, P_i) = f_1 A_i + f_2 P_i * A_i$. In Equation 2, Z_{it}' denotes a vector of control variables,

encompassing demographic and socioeconomic factors like the first stage model. Finally, ϵ_{it} and η_{it} represent the error terms clustered by month-year of birth.

Based on the model specifications, I utilized the 2SLS method to analyze the effects of education level on women's empowerment and attitudes toward violence. As discussed in detail in Section 3.2, estimating using the OLS method may produce biased results regarding the effect of completing at least middle school on the dependent variables. The 2SLS method helps isolate the pure effects of education level on empowerment and attitudes towards violence and emphasizes the instrumental role of education on the dependent variables in the face of systematic and policy-induced changes (Angrist & Pischke, 2008). Furthermore, by isolating and measuring the potential transformative impact of education on empowerment and attitudes toward violence, this method assists in producing empirical evidence that can guide educational and social policies (Card, 1999).

As previously mentioned, this study is based on the fuzzy RDD estimation method. Fuzzy RDD can distinguish between treatment and control groups based on a specific cutoff point, even when this cutoff point is not strictly adhered to (Imbens & Lemieux, 2008). On the other hand, the use of Fuzzy RDD provides a more precise estimation of the causal effect of education, as this method isolates and analyzes the impacts of policy changes by creating a structure similar to random assignment (Hahn, Todd, & Van der Klaauw, 2001). This approach is effective in evaluating the impacts of changes tied to specific dates and conditions, such as education reforms (Thistlethwaite & Campbell, 1960). Moreover, the importance of Fuzzy RDD lies in its ability to determine the causal effects of education. Assuming that education reforms are implemented at a specific date, the differences in education levels between individuals born before and after the cutoff point allow us to isolate the effects of education on empowerment and attitudes towards violence. This method makes comparisons between the groups affected and unaffected by the reform more reliable and provides significant insights into how education shapes social norms and individual behaviors (Lee & Lemieux, 2010).

Additionally, by incorporating the reduced form estimation approach into the analysis, I was able to estimate the magnitude and direction of the direct relationship between the dependent and independent variables without considering intermediary variables (Angrist & Pischke, 2008). This approach is used to measure the direct effects of education and provides a simplified version of complex causal models (Stock & Watson, 2015). In the study, I analyze the direct effects of the 1997 reform on empowerment and attitudes toward violence using the reduced form estimation approach. The significant advantages of this approach include enhancing the generalizability of the findings to a broader population and providing valuable information for policymakers (Duflo, 2001).

In summary, this study provides a robust methodological framework by utilizing Fuzzy RDD and 2SLS methods to analyze the effects of education level on women's empowerment. The criteria for determining treatment and control groups and the analyses conducted using reduced form estimation aim to contribute to the discussions on how education shapes women's empowerment and attitudes toward violence.

CHAPTER 4

EMPIRICAL RESULTS

4.1 MAIN FINDINGS

Regression results using the fuzzy RDD model have been analyzed with TDHS data for the years 2013 and 2018 for the currently-married sample. My analysis focuses on two main dependent variables, as detailed in Section 3.1. The primary main dependent variable examined in the study is the women's empowerment index. This index is constructed using variables from indices previously created with DHS or TDHS data to measure women's empowerment in the literature, combined using the PCA method. As a result of the PCA, the variables in the index are grouped under two main components: attitude toward gender roles and socio-economic status. These two different main components were weighted according to their eigenvalues to form the women's empowerment index, which I used as the primary dependent variable in the analysis.

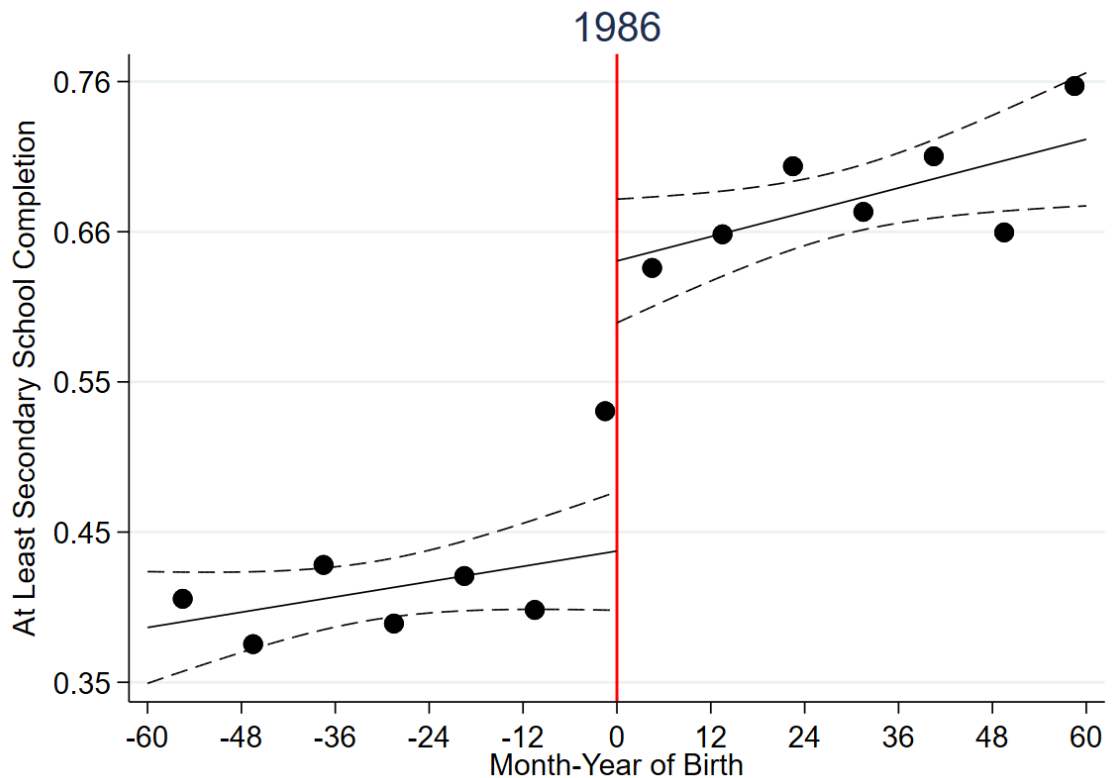
The secondary main dependent variable examined in the study is the attitude towards domestic violence score variable, constructed from five variables in the TDHS data that express attitudes towards beating. Initially, I recoded these five variables as Ewerling et al. (2017) did in their SWPER index, and then I combined these five variables with equal weighting to obtain a score variable. This score variable was included in the analysis to be used as an indicator of the situation regarding domestic violence. An increase in this score indicates that women's attitudes towards violence have improved positively.

In this section, I first presented the estimates of the equation measuring the impact of exposure to the 1997 reform on the probability of at least secondary school completion, which constitutes the first stage of the analysis. Subsequently, I discussed the results of the OLS and 2SLS estimates measuring the impact of at least secondary school completion on the two main dependent variables: the women's empowerment index and the attitude towards violence scores. Additionally, I examined the effects of education on the two separate components within the women's empowerment index, namely the attitude toward gender roles component and the socio-economic component and presented the effects of at least secondary school completion on these components.

I included birth cohorts spanning 60 months (1980-1992) around the cutoff year of 1986 in the analysis. The estimation model is based on the assumption that individuals born between January 1987 and January 1992, encompassing 60 consecutive months by birth month-year, were affected by the reform. Conversely, respondents born between December 1985 and December 1980, also spanning 60 consecutive months by birth month-year, were assumed to be unaffected by the reform and were included in the estimation model as the control group.

In the first stage of the analysis, I examined the impact of the 1997 reform on the probability of completing at least secondary school. Numerous prior studies have shown that the 1997 reform created a significant positive change in the likelihood of women completing at least secondary school and other educational outcomes (Berker, 2023; Erten & Keskin, 2018; Aydemir et al., 2022; Kırđar et al., 2009; Dincer et al., 2013; Gulesci & Meyersson, 2012). Therefore, in this study, I conducted the first stage of my research design to identify the effect of the reform on women's likelihood of completing at least middle school using my dataset. Figure 3 shows the change in the rates of women completing at least middle school around the cutoff year of 1986.

Figure 3: Policy Effect on Women's At Least Secondary School Completion



Notes: The data are taken from the 2013-2018 TDHS. The sample consists of currently-married women aged 15-49. The figure shows women's at least secondary school completion for 60-month time intervals on each side of the cutoff (1980-1992). The red vertical line represents the cutoff, marking the implementation of the compulsory education reform. The left side of the line represents the control group, which is unaffected by the policy, while the right side represents the treatment group, which is affected by the policy.

The graphical analysis created to visualize the effects of the 1997 reform on women's at least middle school graduation rates is shown in Figure 3. According to the figure, the educational participation rates of cohorts exposed and not exposed to the reform are visualized concerning the cutoff line. The area to the left of the red line represents the control group, while the area to the right represents the treatment group. As clearly shown in Figure 3, the 1997 reform significantly increased women's rates of at least secondary school completion. The graphical representation observed in Figure 3 is similarly present in the studies of Aydemir et al. (2022), Akyol and Kırđar (2022), and Berker (2023). Additionally, the clear positive effect depicted in the graph aligns with the results of the regression analyses conducted according to Equation 1, which constitutes the first stage of the estimation model.

The regression findings regarding the relationship between exposure to the reform and the probability of completing at least secondary school are presented in Table 15. The findings confirm the positive relationship shown in Figure 3, and the results are statistically significant. Exposure to the 1997 reform increased the probability of women completing at least secondary school by 21 percentage points. This result is consistent with findings in the literature (Dincer et al., 2012; Kirdar et al., 2016). Kirdar et al. (2016) found strong evidence that the policy nearly doubled the probability of secondary school completion for women compared to the period before the policy. Additionally, Aydemir et al. (2022) found statistically significant results indicating that the policy effect increased the probability of secondary school completion by 16 percentage points. The coefficient value found in this study is closest to Akyol and Kirdar's (2022) finding of a 22 percentage point policy effect in an 8-year time interval. Therefore, I conclude that the policy increased the probability of secondary school completion for women, consistent with the findings in the literature.

In addition to these findings, I determined that the implementation of the 1997 reform resulted in a 51% improvement in the rate of women completing at least secondary school compared to the baseline value. This calculation was made according to Wooldridge's (2019) guidelines for converting percentage points to percentage changes. While percentage point changes merely indicate the change in percentages, percentage changes reflect the change relative to the baseline value, and distinguishing between these rates is crucial in econometric analyses (Wooldridge, 2019; Gujarati & Porter, 2009). Therefore, in this section, I have included both percentage points and percentage changes for all the results presented.

Moreover, the Wald Chi-Square statistic of 1770.79 with a bootstrap p-value of 0.000 further corroborates the statistical significance of the model. This extremely low p-value indicates that the model is highly significant, reinforcing the reliability of the policy variable as a strong predictor for secondary school completion (Stock & Watson, 2015).

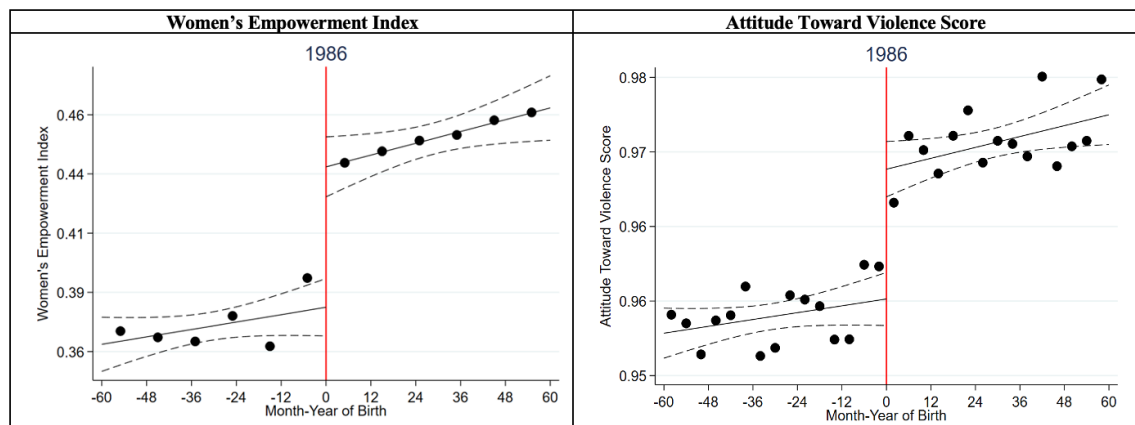
Table 15: The Effect of the 1997 Reform on At Least Secondary School Completion

<i>Policy Effect on At Least Secondary School Completion</i>	
Coefficient	0.212***
Standard Error	0.026
Bootstrap P-value	0.000
Wald Chi-Square Statistic	1764.46
Number of Observation	3,897

Notes: Table 15 presents the coefficients estimated from the first-stage analysis for a 60-month time interval on each side of the cutoff. The sample includes currently-married women aged 15-49 from the 2013 and 2018 TDHS data. The policy variable takes a value of 1 for those born between January 1987 and January 1992 and a value of 0 for those born between December 1980 and December 1985. The bootstrap p-value, calculated with 1000 resamples, assesses the reliability of the estimated p-values, providing robustness in small or complex datasets. *** ρ -value < 0.01, ** ρ -value < 0.05, * ρ -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

After identifying the positive impact of the 1997 reform on the likelihood of completing at least secondary school, I initially conducted a graphical analysis to examine the causal effect of this impact on the two main dependent variables of my study: the women's empowerment index and the attitude toward violence score. Figure 4 illustrates the relationship between exposure to the reform and the women's empowerment index as well as attitudes toward violence score over the 60-month time intervals before and after the cutoff cohort.

Figure 4: The Effects of the 1997 Reform on Dependent Variables



Notes: The sample consists of currently-married women aged 15-49 from the 2013-2018 TDHS. The figure shows the effects of the 1997 reform on both women's empowerment index and attitude toward violence score for 60-month time intervals on each side of the cutoff (1980-1992). The red vertical lines represent the cutoff, marking the implementation of the compulsory education reform. The left side of the line represents the control group, which is unaffected by the policy, while the right side represents the treatment group, which is affected by the policy.

In Figure 4, the graph on the left illustrates the effect on the women's empowerment index, while the graph on the right shows the effect on the attitude toward violence score. In both graphs, a noticeable jump is present at the cutoff line, and a positive trend is observed to the right of the cutoff line (for those born between January 1987 and January 1992). These jumps at the cutoff line occur from approximately 0.39 to 0.45 in the women's empowerment index and from around 0.95 to 0.97 in the attitude toward violence score. This indicates that exposure to the 1997 reform had positive effects on both women's empowerment and attitudes toward violence. Following the graphical analysis, I conducted regression analyses to more precisely measure the impact of the reform on these two main dependent variables.

The primary objective of conducting regression analyses following the graphical analysis is to quantitatively evaluate the relationship between the variables in a more detailed manner. Additionally, while the graphical analysis encompasses individuals who altered their behavior to complete at least middle school as required by the reform and those who did not, the 2SLS method measures the causal effect of education on women's empowerment and attitudes towards violence only for those individuals exposed to the extension of compulsory schooling. Berker (2023) has noted that the group targeted by the 2SLS method is more likely to consist of individuals from disadvantaged socio-economic backgrounds compared to those not affected by the reform, and thus, this group holds significance in terms of public policies. Therefore, in this study, I employed graphical analyses to visualize the relationship between the variables and regression analyses to provide detailed quantitative relationships regarding the effects.

The results of my OLS and 2SLS analyses, aimed at measuring the impact of the 1997 reform on women's empowerment and attitudes toward violence, are presented in Table 16. The OLS and 2SLS estimates provide the necessary information to empirically assess the relationship between completing at least secondary school and the main dependent variables. The regression analyses were conducted for time intervals spanning 60 months on either side of the cutoff point.

As shown in Table 16, the OLS estimates indicate a positive and statistically significant relationship between completing at least secondary school and both main dependent variables. Additionally, the 2SLS estimates, which account for the endogenously determined nature of education level, also reveal a positive and statistically significant relationship for both main dependent variables. Although both estimates demonstrate the existence of a positive relationship, there are substantial differences between the OLS and 2SLS coefficients. In the OLS estimates, it appears that having at least a secondary school diploma increases the women's empowerment index by 6 percentage points and the attitude towards violence score by 2 percentage points. In contrast, the 2SLS estimates show an increase of 29 percentage points in the women's empowerment index and 8 percentage points in the attitude towards violence score.

The OLS estimates indicate an improvement of 16% in the women's empowerment index and 6% in the attitude toward violence score. On the other hand, the percentage changes resulting from the 2SLS estimates are 72% and 20%, respectively, which are consistent with the differences in the OLS and 2SLS coefficients in percentage points. These rates are considerably higher compared to the OLS estimates, suggesting that the reform has had a significant and positive impact on women's empowerment and attitudes toward violence relative to the cutoff point.

The significantly larger coefficients observed in the 2SLS estimates can be attributed to the endogeneity of the independent variables in the OLS regression (Angrist & Imbens, 1995). Endogeneity arises when an explanatory variable is correlated with the error term, leading to biased and inconsistent parameter estimates in OLS regressions (Stock & Watson, 2020). Wooldridge (2010) attributes this issue to omitted variable bias, measurement error, or simultaneity. The 2SLS method addresses this endogeneity by using instrumental variables that are correlated with the endogenous explanatory variable, in this case, completing at least secondary school, but uncorrelated with the error term of the regression model (Greene, 2012). This two-stage approach first predicts the endogenous variable using the instrumental variables and then uses these predictions to estimate its impact on the dependent variables in the second stage.

The main advantage of the 2SLS approach is that it provides consistent and unbiased estimates (Angrist & Imbens, 1995). In this case, the larger coefficients obtained from the 2SLS estimates indicate that the OLS regression underestimates the true impact of education due to endogeneity bias. In other words, the significant differences between the OLS and 2SLS coefficients highlight the importance of addressing endogeneity to obtain more reliable estimates. By correcting for this bias, the 2SLS method provides a clearer understanding of the policy effects on the women's empowerment index and the attitude toward violence score, revealing a stronger causal relationship than initially suggested by the OLS estimates.

To evaluate the results, I first addressed the high positive impact on women's empowerment. As mentioned in Chapter 2, there are numerous studies in the literature that measure the effects of educational reforms on women's empowerment by considering various dynamics. In particular, Nguyen-Phung and Nthenya (2023), Samarakoon and Parinduri (2014), Sahue (2019), and Dincer et al. (2013) have examined women's empowerment using research methods similar to those employed in this study. In line with the findings of these studies, my results indicate that the attainment of at least a secondary school diploma, as a consequence of the 1997 reform, has positively affected women's empowerment. Since the variables comprising the indices differ across nearly all studies that construct such indices, I discussed the positive impact on the index through its components.

Similarly, the effect of having at least a secondary school diploma on the attitude toward violence score, another main dependent variable in the analysis, was also found to be positive. However, this effect is much lower compared to its impact on the women's empowerment index. This finding aligns with the results of studies in the literature (Gulesci et al., 2020; Akyol & Kırdar, 2022). On the other hand, unlike these studies, Erten and Keskin (2018) did not find any statistical evidence of a reform effect on women's attitudes toward violence. The possibility of reaching different results in their study may be due to the use of the NS-DVW survey. The modest but statistically significant findings obtained at this point can contribute to the literature due to the use of the 2013 and 2018 TDHS data with this research method.

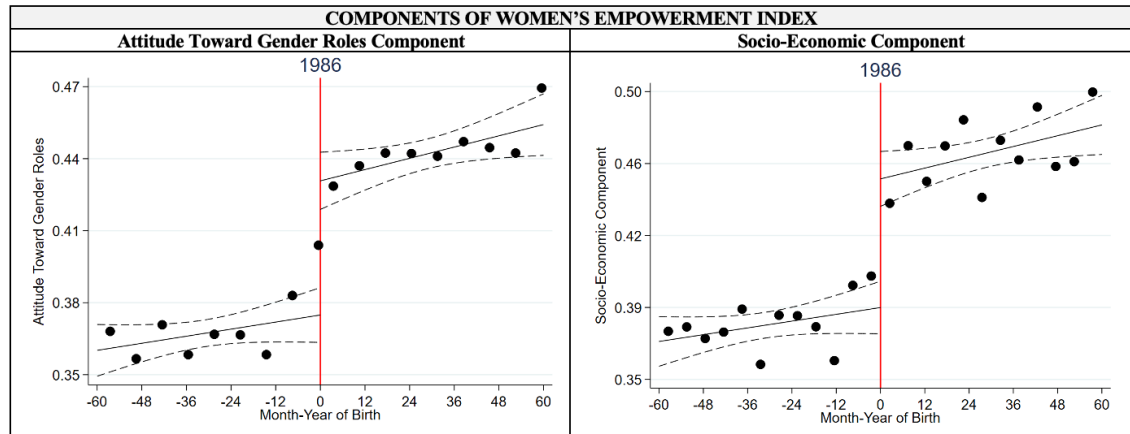
Table 16: OLS and 2SLS Results for Dependent Variables

<i>At Least Secondary School Completion</i>				
	Women's Empowerment Index		Attitude Toward Violence Score Var.	
	OLS	2SLS	OLS	2SLS
Coefficient	0.069***	0.299***	0.027***	0.083***
Standard Error	0.005	0.016	0.003	0.006
Bootstrap p-value	0.000	0.000	0.000	0.000
Number of Observation	3,256	3,256	3,893	3,893

Notes: Table 16 presents the coefficients estimated from OLS and the 2SLS analysis for a 60-month time interval on each side of the cutoff. The sample includes currently-married women aged 15-49 from the 2013 and 2018 TDHS data. The policy variable takes a value of 1 for those born between January 1987 and January 1992 and a value of 0 for those born between December 1980 and December 1985. The bootstrap p-value, calculated with 1000 resamples, assesses the reliability of the estimated p-values, providing robustness in small or complex datasets. *** ρ -value < 0.01 ** ρ -value < 0.05 * ρ -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Additionally, to discuss the findings of the index with those in the literature, I conducted a separate analysis of the reform's impact on each component, considering that the women's empowerment index comprises two factors: the gender role attitudes component and the socio-economic component. Initially, I conducted a graphical analysis to visualize the relationship between exposure to the reform and the two different components of women's empowerment. Figure 5 presents information on the left side regarding the attitude toward the gender component, while the right side provides data on the socio-economic component. As shown in Figure 5, both components exhibit a significant jump at the cut-off point. This jump and the overall appearance of the graphs align with Figure 4, which provides information on the overall women's empowerment index. In the graph for the first component, attitude toward gender roles, the jump at the cut-off point occurs from approximately 0.38 to 0.43. For the second component, socio-economic, the jump occurs from approximately 0.39 to 0.46. Based on these results, the effect of the reform on the socio-economic component can be expected to be relatively greater than its effect on the attitude toward gender roles component.

Figure 5: The Effects of the 1997 Reform on Components of WE Index



Notes: The data are taken from the 2013-2018 TDHS. The sample consists of currently-married women aged 15-49. The figure shows the effects of the 1997 reform on both the attitude toward gender roles component and the socio-economic component for 60-month time intervals on each side of the cutoff (1980-1992). The red vertical lines represent the cutoff, marking the implementation of the compulsory education reform. The left side of the line represents the control group, which is unaffected by the policy, while the right side represents the treatment group, which is affected by the policy.

Following the graphical analysis, Table 17 presents the 2SLS analysis results for these two components. According to my findings, the 1997 reform had a 28 percentage point effect on women's attitudes toward gender roles. This percentage point indicates that there is a 68% improvement in the attitude toward gender roles component as a result of the reform, relative to the cutoff point. This effect is both substantial and statistically significant. Similarly, I found a 33 percentage point impact on the socio-economic component of women's status. This value corresponds to an approximate improvement of 81% in the socio-economic component. Consistent with the jumps observed in the graphical analysis in Figure 5, the regression findings also indicate that the effect of the 1997 reform on the socio-economic component is relatively greater than its effect on the attitude towards gender roles component. Parallel to the findings of this study, Deole and Zeydanli (2021) also found that increased education led to improvements in women's attitudes toward gender roles. Conversely, Gulesci et al. (2020) examined gender role attitudes independently and did not find statistically significant results on this topic. However, since the sample used in their analysis differs significantly from that of this study, direct comparisons between the findings may not be appropriate.

On the other hand, the positive effect of socioeconomic factors has been demonstrated in previous studies through many of the variables included in the component. For example, concerning women's labor force participation, Tunali et al. (2019) found that the reform resulted in women gaining a more advantageous position in the labor market, and the socio-economic component of the index includes a variable that refers to women's employment status. Similarly, Akyol and Kirdar (2020) found a positive but statistically insignificant result for urban women's labor force participation. Additionally, Dincer et al. (2013) identified a positive effect of the reform on women's knowledge about their ovulation cycles.

Table 17: The Effect of 1997 Reform on Women's Empowerment Index Components

<i>At Least Secondary School Completion</i>		
	Gender Role Attitudes Component	Socio-Economic Component
Coefficient	0.282***	0.338***
Standard Error	0.021	0.014
Bootstrap p-value	0.000	0.000
Number of Observation	3,256	3,256

Notes: Table 17 presents the coefficients estimated from the 2SLS analysis for a 60-month time interval on each side of the cutoff. The sample includes currently-married women aged 15-49 from the 2013 and 2018 TDHS data. The policy variable takes a value of 1 for those born between January 1987 and January 1992 and a value of 0 for those born between December 1980 and December 1985. The bootstrap p-value, calculated with 1000 resamples, assesses the reliability of the estimated p-values, providing robustness in small or complex datasets. *** p -value <0.01 , ** p -value <0.05 , * p -value <0.1 denote significance levels of 1%, 5%, and 10%, respectively.

In summary, the findings demonstrate that the reform increased the likelihood of completing at least secondary school by 21 percentage points, which is consistent with previous studies in the literature. This value corresponds to an approximate improvement of 51% in at least secondary school completion. This increase in educational attainment has led to significant improvements in women's empowerment and attitudes toward domestic violence. The women's empowerment index and the attitude toward domestic violence score both showed marked increases due to the reform, indicating that enhanced educational opportunities have wide-ranging and positive effects on women. I found that the reform resulted in a 29 percentage point increase in the women's empowerment index and an 8 percentage point increase in the attitude towards domestic violence score. These values have allowed us to determine that the 1997 reform has resulted in improvements of 72% and 20%, respectively, in the two main dependent variables of the analysis.

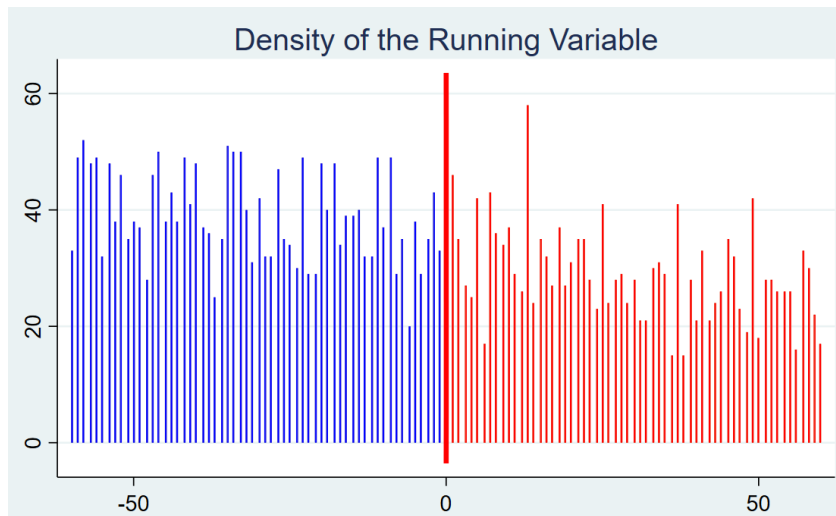
Additionally, I examined the two components of the women's empowerment index separately, which are attitudes toward gender roles and socio-economic status. The findings indicate that the reform led to increases of 28 and 33 percentage points in these components, respectively. These percentage points indicate that the reform has resulted in improvements of 68% and 81% in the components of the index, respectively. These findings demonstrate that higher educational attainment both positively changes perceptions of gender roles and significantly improves women's socio-economic status. Furthermore, all the results I obtained are statistically significant. These results underscore the importance of educational policies in promoting gender equality and social development, providing valuable insights for future policy-making and academic research.

4.2 ROBUSTNESS ANALYSIS

In this section, I analyze the robustness of the Regression Discontinuity Design (RDD) model in estimating the impact of educational level on women's empowerment and attitudes toward violence in my thesis. The reliability of the RDD method can be assessed through various analyses.

Firstly, in studies utilizing the Regression Discontinuity Design (RDD) strategy, it is important to examine the density distribution of the running variable to check for the robustness of the model. This analysis is conducted to detect any manipulation around the cutoff point. McCrary (2008) emphasized the importance of checking for discontinuities in the density around the cutoff point to ensure the validity of the model. Therefore, analyzing the density of the running variable has become a standard practice to confirm the absence of manipulation by verifying the smoothness of the density around the threshold (McCrary, 2008; Imbens & Lemieux, 2008). Figure 6 shows the density distribution of the running variable used in my study. As observed, the histogram analysis does not provide any evidence of anomalies that would suggest manipulation. This finding indicates that the robustness and validity of the main results are maintained.

Figure 6: Density of the Running Variable



Secondly, ensuring the validity of the model's identification strategy requires the comparison of younger birth cohorts with older birth cohorts. These comparisons ensure that changes in at least middle school completion and the dependent variables can be attributed solely to the reform. However, to ensure this validity, two possibilities must be eliminated: differences in age and period effects between birth cohorts and pre-reform trends (Berker, 2023). Conducting a placebo test in RDD analysis is crucial for strengthening the causality claim and ensuring the accuracy of the model (Cattaneo et al., 2019; Lee & Lemieux, 2010). Additionally, it is a critical robustness check to eliminate the effects of external factors and enhance the reliability of the study's findings (Huntington-Klein, 2021). In this context, I examined the effects of placebo reforms by shifting the reform years three and six years backward and forward in Table 19. In this table, panel (A) presents the results for at least middle school completion, panel (B) shows the results for the women's empowerment index, and panel (C) displays the results for attitudes toward violence, comparing the actual and placebo reforms.

The sample in the placebo analysis includes the birth month-year cohorts from December 1980 to December 1985 and from January 1987 to January 1992. The placebo reforms before the actual 1997 reform encompass the birth cohorts that were not exposed to the policy change (December 1980 to December 1985), while the placebo reforms after the 1997 reform encompass the birth cohorts that were exposed to

the policy change (January 1987 to January 1992). In this table, Column (3) shows the OLS results for the actual reform year (1986), which are also presented in the main results section. Column (1) presents the placebo reform results for six years before the actual reform (1980), and Column (2) presents the results for three years before the actual reform (1983). Conversely, Column (4) shows the placebo reform results for three years after the actual reform (1989), and Column (5) presents the results for six years after the actual reform (1992).

According to the results presented in Table 18, no statistically significant effect was found for the placebo reform years other than the actual reform year. In other words, my findings indicate that placebo reforms do not have a positive effect. This suggests that the 2SLS estimates measure the causal effect of education on the dependent variables independently of birth cohort-specific trends (Cattaneo et al., 2021; Lee & Lemieux, 2010). In conclusion, this robustness analysis demonstrates that the causal effect of the actual reform on education and the dependent variables, as identified in the main analysis, is valid and reliable.

Table 18: Estimated Impacts of Placebo Reforms: OLS Results

	(1)	(2)	(3)	(4)	(5)
Placebo Reform Years	1980	1983	Actual Reform: 1986	1989	1992
A) At Least Secondary School Completion					
Exposure to Reform	-0.010 (0.028)	0.035 (0.023)	0.200*** (0.032)	-0.056 (0.051)	0.025 (0.060)
Number of Observations	3,358	3,538	3,897	2,444	1,585
B) Women's Empowerment Index					
Exposure to Reform	-0.004 (0.033)	-0.131 (0.007)	0.062*** (0.007)	0.006*** (0.008)	-0.050 (0.057)
Number of Observations	2,573	2,780	3,256	2,143	1,433
C) Attitude Toward Violence					
Exposure to Reform	0.014 (0.009)	-0.009 (0.010)	0.023*** (0.004)	0.014 (0.012)	-0.000 (0.013)
Number of Observations	3,357	3,535	3,893	2,440	1,585

Notes: In Table 18, Column (3) presents the estimated impacts of the actual reform given in the study. Columns (1) and (2) show the effects of placebo reforms defined by setting three and six years earlier than the actual reform year,

respectively. In the first set of empirical exercises, the sample consists of the birth month-year cohorts from 1975-1985, who were not exposed to the reform. Columns (4) and (5) show the effects of placebo reforms defined by setting the reforms three and six years later than the actual reform year, respectively. In the second set of empirical exercises, the sample consists of the birth month-year cohorts from 1980-1992, who were exposed to the reform. Panel (A) examines the effects of placebo reforms on the completion of at least middle school for women. Panels (B) and (C) present the effects of the same placebo reforms on the women's empowerment index and attitudes toward violence scores, respectively. *** p -value <0.01 ** p -value <0.05 * p -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Thirdly, one of the important features of fuzzy RDD analysis is determining a time interval that measures the distance to the cutoff birth cohort on both sides. This interval is defined as the bandwidth in the literature. The bandwidth determines the birth cohorts covered when comparing the pre-reform and post-reform periods. Changing the bandwidth means a change in the number of observations, which leads to variations in the estimates (Gelman & Imbens, 2019). At this point, the bias-precision tradeoff is a fundamental consideration in statistical analysis, particularly in methods like fuzzy RDD (James et al., 2013). This tradeoff involves balancing two competing aspects: bias and precision. Bias refers to the systematic error introduced when estimates deviate from the true effect due to inappropriate bandwidth selection (Friedman, 2009). A wider bandwidth, while increasing the number of observations and hence the precision can introduce more bias as it includes less comparable data points farther from the cutoff. On the other hand, a narrower bandwidth minimizes bias by focusing on observations close to the cutoff, but this increases standard errors due to a smaller sample size, thereby reducing precision. Effective analysis requires carefully selecting a bandwidth that appropriately balances these two aspects to ensure robust and reliable estimates (Kuhn & Johnson, 2013).

The results of this robustness analysis are presented in Table 19. Panel (A) shows the policy effect on at least secondary school completion, Panel (B) shows the policy effect on the women's empowerment index, and Panel (C) shows the policy effect on the attitude towards violence score for different bandwidths. Initially, I employed the global-to-local approach used by Aydemir et al. (2022). According to this approach, I gradually narrowed the bandwidth from 120 months to the cutoff point. For this purpose, I recalculated the 2SLS estimates by successively narrowing the bandwidths to

96, 72, 60, 48, 36, and 24 months. As a result of the narrowing, the coefficients show an increasing trend from 120 months to the cutoff point of 60 months used in the main analyses. Conversely, when I gradually widened the bandwidth from 24 months to the cutoff point, an increasing trend in coefficients was also observed. Overall, the findings are statistically significant in both approaches. As clearly shown in Table 19, the 60-month bandwidth used in my main analysis demonstrates coefficients that are average compared to other bandwidths.

As a result of this robustness analysis, I found that while narrowing the bandwidth from 120 months to 60 months and widening it from 24 months to 60 months, the coefficients showed an increasing trend. This indicates that the 60-month bandwidth used in my main analysis demonstrates average values compared to other bandwidths and, therefore, provides more effective results compared to other bandwidths. Consequently, this supports the reliability and validity of the main results.

Table 19: 2SLS Results with Different Month-Year Bandwidths

<i>Month-Year Bandwidth (Each Side of the Cutoff)</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	120-Month	96-Month	72-Month	60-Month	48-Month	36-Month	24-Month
<i>A) Policy Effect on At Least Secondary School Completion</i>							
Coefficient	0.205***	0.208***	0.209***	0.212***	0.218***	0.197***	0.127**
Standard Error	0.019	0.021	0.024	0.026	0.030	0.036	0.043
Number of Observation	6,879	5,872	4,613	3,897	3,134	2,376	1,622
Wald Chi-Square Statistic	3259.10	2699.25	2109.80	1764.46	1480.63	1087.07	704.77
<i>B) Policy Effect on Women's Empowerment Index</i>							
Coefficient	0.292***	0.290***	0.291***	0.299***	0.308***	0.354***	0.350***
Standard Error	0.012	0.013	0.015	0.016	0.018	0.021	0.026
Number of Observation	5,697	4,911	3,858	3,256	2,627	2,000	1,359
Wald Chi-Square Statistic	568.72	470.24	363.44	321.67	277.21	269.40	172.42
<i>C) Policy Effect on Attitude Toward Domestic Violence Score</i>							
Coefficient	0.083***	0.077***	0.080***	0.083***	0.077***	0.073***	0.074***
Standard Error	0.005	0.005	0.006	0.006	0.007	0.008	0.010
Number of Observation	6,874	5,867	4,609	3,893	3,130	2,372	1,618
Wald Chi-Square Statistic	236.13	183.70	156.28	148.30	109.42	76.25	51.67

Notes: Table 19 presents the 2SLS estimates for different month-year bandwidths. Column (1) shows the estimates for a 120-month bandwidth. Similarly, Columns (2) and (3) provide regression results for 96-month and 72-month bandwidths, respectively. The 60-month bandwidth in Column (4), which is also the bandwidth used in the main analysis, is highlighted in bold for comparison purposes. Columns (5), (6), and (7) present the 2SLS results for progressively narrower bandwidths of 48, 36, and 24 months, respectively. Panel (A) contains results based on the completion of at least secondary school by birth year. Panels (B) and (C) provide information on the different bandwidths for the women's empowerment index and attitudes towards violence score, which are the independent variables of the model. *** p -value <0.01 ** p -value <0.05 * p -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Fourth, Kirdar et al. (2016) noted that the reform was implemented with a one-year delay in certain rural areas due to various reasons. Based on this information, the reform should have affected individuals born in January 1988 and later in some regions. In the main results, I excluded only individuals born in 1986 from the sample. In this robustness analysis, taking into account the one-year delay in some regions, I also excluded individuals born in 1987 from the sample. Therefore, I revised my regression estimates using a "donut-hole" RDD design, excluding individuals born in 1986 and 1987 from the sample.

Donut-hole RDD is a regression discontinuity design that excludes observations immediately around the cutoff point and aims to reduce bias arising from anomalies or special conditions near the cutoff point (Cattaneo et al., 2020; Barreca et al., 2011). Estimating using donut-hole RDD by excluding both the years 1986 and 1987 has been employed by Akyol and Kirdar (2022) and Aydemir et al. (2022). The 2SLS analyses conducted using the donut-hole method, excluding the 1986 and 1987 birth cohorts, show negligible differences in coefficients compared to the main 2SLS analyses without the donut-hole, as presented in Table 20. Both methods generally reveal positive and statistically significant effects of the policy. Consequently, both approaches yielded very similar results, and this robustness analysis reached similar conclusions to the main analysis.

Table 20: 2SLS Results with Donut-Hole RDD

	(1)	(2)	(3)
	At Least Secondary School Completion	Women's Empowerment Index	Attitude Toward Violence Score
<i>A) With Donut-Hole (1986 & 1987 Month-Year Birth Cohort Excluded)</i>			
Coefficient	0.242**	0.301***	0.082***
Standard Error	0.026	0.016	0.006
Bootstrap p-value	0.000	0.000	0.000
Number of Observation	3,769	3,168	3,766
<i>B) No Donut-Hole (Only 1986 Month-Year Birth Cohort Excluded)</i>			
Coefficient	0.212***	0.299***	0.083***
Standard Error	0.026	0.016	0.006
Bootstrap p-value	0.000	0.000	0.000
Number of Observation	3,897	3,256	3,893

Notes: Table 20 examines the donut-hole RDD approach alongside the 2SLS results. Panel (A) presents the results of

the donut-hole model, which excludes the 1986 and 1987 month-year birth cohorts from the model. Panel (B) shows the results of the main analysis, which excludes only the 1986 month-year birth cohort, without a donut-hole. Column (1) contains the results for at least secondary school completion, Column (2) presents the results for the women's empowerment index, and Column (3) includes the results related to the attitude toward violence score. The bootstrap p-value, calculated with 1000 resamples, assesses the reliability of the estimated p-values, providing robustness in small or complex datasets. *** p -value <0.01 ** p -value <0.05 * p -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Fifth, I analyze the robustness of my findings by replacing the endogenous variable used in my research design, which is the completion of at least a middle school education, with the number of years of education completed. This robustness analysis approach has been similarly employed by Aydemir et al. (2022) and Card (2001). According to findings at Table 21, both the number of years of schooling and the completion of at least secondary school are positively associated with the outcomes studied. Each additional year of schooling or the completion of secondary education increases secondary school completion rates, women's empowerment, and positive attitudes toward violence. The statistical significance across all variables and models suggests that education plays a crucial role in these outcomes. The coefficients are larger when the endogenous variable is "Years of Schooling" compared to "At Least Secondary School Completion" indicating that the marginal effect of each additional year of schooling is substantial.

Table 21: 2SLS Results for Years of Schooling as the Endogenous Variable

	(1)	(2)	(3)
	First Stage Result	Women's Empowerment Index	Attitude Toward Violence Score
<i>A) Years of Schooling as the Endogenous Variable</i>			
Coefficient	0.728**	0.041***	0.009***
Standard Error	0.222	0.001	0.000
Bootstrap p-value	0.000	0.000	0.000
Number of Observation	3,897	3,256	3,893
<i>B) At Least Secondary School Completion as the Endogenous Variable</i>			
Coefficient	0.212***	0.299***	0.083***
Standard Error	0.026	0.016	0.006
Bootstrap p-value	0.000	0.000	0.000
Number of Observation	3,897	3,256	3,893

Notes: Table 21 presents the 2SLS results for the analysis with years of schooling as the endogenous variable in Panel (A). Panel (B) shows the 2SLS results for the main analysis, which uses at least secondary school completion as the endogenous variable, for comparison purposes. Column (1) contains the results for at least secondary school

completion, Column (2) presents the results for the women's empowerment index, and Column (3) includes the results related to the attitude toward violence score. The bootstrap p-value, calculated with 1000 resamples, assesses the reliability of the estimated p-values, providing robustness in small or complex datasets. *** ρ -value<0.01 ** ρ -value<0.05 * ρ -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Sixthly, I estimated the standard errors clustered at the birth cohort level and the Eicker-White (EHW) standard errors for both independent variables. Robust standard errors are employed to obtain reliable results when heteroskedasticity is present in the data. Heteroskedasticity refers to the situation where the variance of the errors in a regression model is not constant, meaning that the spread of the errors varies (Cunningham, 2021). In empirical studies, it is common practice to use robust standard errors and the associated confidence intervals to account for the presence of heteroskedasticity (Imbens & Kolesar, 2016). EHW standard error estimation is frequently preferred in this context. Consequently, I checked for the presence of heteroskedasticity by calculating EHW standard errors. Table 22 presents information on both sets of standard errors. According to Imbens and Kolesar (2016), the similarity between normal standard errors and EHW standard errors can indicate that there is no significant heteroskedasticity in the data. As shown in Table 22, the difference between the standard errors is 0.001 in Column (1) and 0.000 in Column (2). This indicates a high degree of similarity between the two sets of standard errors, suggesting that there is no heteroscedasticity problem in the model. In conclusion, the main finding of the study remains valid as evidenced by the results of this robustness analysis.

Table 22: Heteroscedasticity-robust Standard Errors

	(1)	(2)
	Women's Empowerment Index	Attitude Toward Violence Score
Coefficient	0.299***	0.083***
Standard Error	0.016	0.006
Heteroscedasticity-robust Standard Errors	0.017	0.006
Number of Observation	3,256	3,893

Notes: The estimates in Table 22 show the results obtained by applying the 2SLS method. Column (1) contains the results related to the women's empowerment index, while Column (2) presents the results related to the attitude towards violence score. *** ρ -value<0.01 ** ρ -value<0.05 * ρ -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Seventhly, to assess the robustness of my model, I included variables related to birth cohort trends estimated through a second-degree polynomial function. The primary objective of this robustness analysis is to accurately evaluate the impact of birth cohort trend variables on the model and to determine whether the model's results remain consistent irrespective of these effects (Angrist & Pischke, 2009). By employing a second-degree (quadratic) polynomial function, I accounted for the nonlinear effects of birth cohort trends, thereby testing the overall validity and reliability of the model through a different analytical approach. According to Cameron and Trivedi (2005), such an analysis reveals more complex structures and potential biases in the model used in the main analysis, reinforcing the robustness and validity of the study's primary findings. Therefore, this robustness analysis has also been utilized in similar studies to test the reliability of the model (Samarakoon & Parinduri, 2015; Berker, 2023; Aydemir et al., 2022). Table 23 presents the results of the analysis conducted in this study. Column (1) presents the results for the women's empowerment index, while column (2) shows the results for the attitude toward violence score. As seen from the results of the robustness analysis, the coefficients and standard errors for both main dependent variables are quite similar to those of the 2SLS estimates presented in main analysis (Table 16). In this case, I have determined that the main finding of the study remains valid in both empirical analyses.

Table 23: Impacts of Quadratic Birth Cohort Trends on 2SLS Estimation Results

<i>At Least Secondary School Completion</i>		
	(1)	(2)
	Women's Empowerment Index	Attitude Toward Violence Score
Coefficient	0.307***	0.084***
Standard Error	0.017	0.006
Number of Observation	3,256	3,893

Notes: The estimates in Table 23 show the impacts of the quadratic nature of the function structure of the birth cohort trends on estimation results by applying the 2SLS method. Column (1) contains the results related to the women's empowerment index, while Column (2) presents the results related to the attitude towards violence score. *** ρ -value < 0.01 ** ρ -value < 0.05 * ρ -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Seventhly, to assess the robustness and reliability of my analyses and to reference their generalizability, I applied the same research design to the ever-married sample. As mentioned in previous sections, some similar studies conducted using the DHS have performed their analyses on currently-married or currently-partnered samples (Tesfa et

al., 2022; Ewerling et al. 2017; Phan, 2016; Kitila et al., 2016; Samarakoon & Parinduri, 2015). Alternatively, some studies have focused on the ever-married sample (Yıldız et al., 2021; Erten & Keskin, 2018; Gulesci & Meyersson, 2013). Using two different samples to validate the results can confirm that the initial findings are not coincidental (Cooper, 2015). Therefore, by applying the same analyses to the ever-married sample, I obtained findings for two distinct samples based on the main findings of my study. The analyses conducted for both the ever-married and currently-married samples are presented in Table 24. Panel (A) presents the 2SLS information for the ever-married sample, while Panel (B) presents the 2SLS information for the currently-married sample used in the main analysis. As shown in Table 24, the findings for both samples are nearly identical in terms of coefficient values, standard deviations, and statistical significance levels. The coefficients, with very small differences, are higher for the currently-married sample than for the ever-married sample in terms of the probability of completing at least middle school, the women's empowerment index, and the attitude towards violence score. Obtaining similar results across different samples indicates that your findings are not limited to a specific data set and are generalizable (Shadish et al., 2002). Consequently, these analyses performed on both samples demonstrate that the main finding of the study remains valid, that the results are not coincidental, and that they are not restricted to a particular sample.

Table 24: 2SLS Results for Ever-Married and Currently-Married Sample

	(1)	(2)	(3)
	At Least Secondary School Completion	Women's Empowerment Index	Attitude Toward Violence Score
A) 2SLS Results for Ever-Married Sample			
Coefficient	0.209***	0.296***	0.082***
Standard Error	0.026	0.016	0.006
Bootstrap p-value	0.000	0.000	0.000
Number of Observation	4,050	3,375	4,046
B) 2SLS Results for Currently-Married Sample (Main Analysis)			
Coefficient	0.212***	0.299***	0.083***
Standard Error	0.026	0.016	0.006
Bootstrap p-value	0.000	0.000	0.000
Number of Observation	3,897	3,256	3,893

Notes: Table 24 presents the 2SLS results for the ever-married sample in Panel (A). Panel (B) presents the 2SLS results for the currently-married sample used in the main analysis. Column (1) contains the results for at least secondary school completion, Column (2) presents the results for the women's empowerment index, and Column (3)

includes the results related to the attitude toward violence score. The bootstrap p-value, calculated with 1000 resamples, assesses the reliability of the estimated p-values, providing robustness in small or complex datasets. *** p -value <0.01 ** p -value <0.05 * p -value < 0.1 denote significance levels of 1%, 5%, and 10%, respectively.

Ninth and finally, I examined the policy impact on the completion rates of at least primary, secondary, and high school education among women by comparing control and treatment groups across different residential areas. Analyzing the effects of the 1997 reform on women's education levels in residential areas is a common approach in the literature (Du et al., 2021; Yıldız et al., 2021; Kırdar et al., 2016; Dulger, 2004). This approach, similar to the previous analysis, aims to enhance the generalizability and validity of the main findings.

For instance, Kırdar et al. (2016) found that in cases where differences between rural and urban areas were considered, the completion rates of both compulsory and higher education levels significantly increased due to the 1997 reform. Importantly, they concluded that the completion rate of 8th grade among women living in rural areas, the most disadvantaged group, increased by approximately 30-40 percentage points (Kırdar et al., 2016). By assessing this situation in my own study, I investigated both the impact of the reform on education by type of residential area and the outcomes of these effects on women's empowerment and attitudes toward violence, distinguishing between rural and urban areas.

In Table 25, I analyzed the differences in education completion rates between women in the treatment and control groups, differentiated by urban and rural areas. As shown in the table, the percentage change between the treatment and control groups for Column (2), which indicates the probability of completing secondary school, is 63% for the full sample in Panel A, 50% for the urban sample in Panel B, and 188% for the rural sample in Panel C. Based on these results, it was determined that the policy effect on the probability of completing at least secondary school is significantly high in rural areas. A similar situation is observed in Column (3), which indicates the probability of completing at least high school, though the rates are lower than those for completing at least secondary school. In Column (1), which shows the probability of completing at least primary school, there are negative percentage changes. This indicates that the

completion rates for different education levels have shifted as a result of the policy. In other words, as the probability of completing at least secondary school increased due to exposure to the policy, the probability of completing at least primary school, a lower education level, decreased. This decrease is more pronounced in the urban sample compared to the rural one. These findings are consistent with those of Kırdar et al. (2016).

Table 25: Educational Attainments for Treatment and Control Group by Place of Residence (%)

	(1)	(2)	(3)
	At Least Primary School Completion	At Least Secondary School Completion	At Least High School Completion
A) Full Sample			
Control group: 1980-1985 birth cohort	85.47	41.14	31.89
Treatment group: 1987-1992 birth cohort	83.59	67.42	34.84
Percentage change between the treatment group and the control group (%)	-2	63	9
B) Urban Sample			
Control group: 1980-1985 birth cohort	87.93	47.12	37.46
Treatment group: 1987-1992 birth cohort	86.25	70.70	41.25
Percentage change between the treatment group and the control group (%)	-1	50	10
C) Rural Sample			
Control group: 1980-1985 birth cohort	76.95	20.38	12.57
Treatment group: 1987-1992 birth generation	76.63	58.81	18.03
Percentage change between the treatment group and the control group (%)	-0.4	188	43

Notes: Table 25 presents the percentage rates (%) of educational attainment for treatment and control groups across the full, urban, and rural samples. Column (1) shows the status of being at least a primary school graduate, Column (2) shows the status of being at least a secondary school graduate, and Column (3) shows the status of being at least a high school graduate. Panel (A) provides information for the full sample, Panel (B) for the urban sample, and Panel (C) for the rural sample.

In summary, the various robustness analyses conducted on the research design in this study demonstrate the reliability and validity of the main findings. The density distribution analysis, which confirms the absence of manipulation around the cutoff point, supports the integrity of the RDD strategy. Placebo tests comparing younger and older birth cohorts further substantiate that the identified causal effects are not driven by cohort-specific trends or external factors, thereby enhancing the credibility of the results. Additionally, varying the bandwidth and employing the donut-hole RDD design yield consistent findings, reinforcing the robustness of the estimates across different model specifications and sample exclusions.

The use of different endogenous variables, such as years of schooling, and the estimation of robust standard errors addressing heteroskedasticity issues, further corroborate the study's conclusions. Accounting for birth cohort trends through second-degree polynomial functions and analyzing both currently married and ever-married samples demonstrate a high degree of generalizability and reliability of the findings. Moreover, examining the impact of the reform on educational attainment across different residential areas reveals significant effects, particularly in rural regions, aligning with the existing literature. These robustness checks confirm that the primary results of the study are not only valid but also resilient to various analytical approaches and sample variations.

CONCLUSION

In this thesis, I investigated the causal impact of education on women's empowerment in Turkey. The 1997 compulsory education reform, which extended the duration of compulsory education from 5 to 8 years in Turkey, provided the necessary natural experiment for this study. I utilized the Turkey-specific data from the 2013 and 2018 waves of the TDHS conducted by HUIPS, focusing exclusively on married women. The research design adopted the fuzzy RDD method. To monitor women's empowerment, I created a Women's Empowerment Index and developed an indicator incorporating attitudes toward domestic violence to examine the effects of the policy. Additionally, I analyzed the results by decomposing the Women's Empowerment Index into two components: gender role attitudes and socio-economic status. Furthermore, I conducted separate analyses based on regional samples.

The analysis shows that the 1997 reform increased the probability of women completing at least secondary school by 21 percentage points. Based on the 21 percentage point increase, my calculations indicate that exposure to the reform increased the likelihood of women completing at least middle school by 51% relative to the initial probability. This substantial rise aligns with previous studies, demonstrating the reform's effectiveness in improving women's educational outcomes. Notably, this educational improvement translates into significant advancements in women's empowerment and attitudes toward domestic violence.

My main findings indicate that the increased likelihood of completing at least middle school, resulting from exposure to the reform, raised the women's empowerment index by 72% and improved attitudes toward domestic violence score by 20%. These findings underscore the transformative role of education in promoting gender equality and empowering women. Achieving higher levels of education provides women with the knowledge, skills, and confidence necessary to participate more actively in socio-economic and political spheres, thereby enhancing their overall empowerment. Moreover, the empowering effect is particularly significant for individuals whose

educational behavior changed due to exposure to the reform. Indeed, the 2SLS method used in my analysis provides results specific to this group. The extension of compulsory education by three additional years for socio-economically disadvantaged women, who would have otherwise completed their education after the 5-year compulsory period, has resulted in empowerment improvements in their lives, as identified in this study's findings.

In addition to the analyses conducted on the two main dependent variables, I also deconstructed the Women's Empowerment Index into its two components: the attitude toward gender roles component and the socio-economic component. The results indicated that women who were more likely to complete at least middle school due to exposure to the reform experienced a 68% improvement in their attitudes toward gender roles and an 81% improvement in their socio-economic status. These findings demonstrate that higher levels of education not only enhance various dimensions of women's empowerment but also increase awareness of gender equality and place women in a stronger socio-economic position.

On the other hand, to test the validity and reliability of my main findings, I conducted nine different robustness analyses. Through a series of comprehensive tests—including examining the density distribution of the running variable, conducting placebo tests, varying bandwidths, applying a donut-hole approach, using years of schooling as an alternative endogenous variable, and estimating heteroskedasticity-robust standard errors—the study consistently demonstrates the positive causal effects of education. These rigorous checks ensure that the findings are not influenced by external factors or model specifications, thus reinforcing the robustness of the results and the overall contribution of this research to understanding the role of education in enhancing women's empowerment and attitude toward violence. According to the results of these robustness checks, the findings from my main analysis remain valid.

In addition, the reform's positive effects are especially pronounced in rural areas, where the probability of completing secondary school increased by 188% for women in the treatment group compared to the control group. This significant improvement in

educational attainment in rural areas highlights the critical role of education policies in addressing regional disparities and promoting equitable development.

Previous research has shown the positive effects of extending compulsory education on women's empowerment. For example, studies in developed countries by Skirbekk et al. (2004) and Deole and Zeydanli (2021) emphasize that increased education positively impacts women's life events and attitudes toward gender equality. Similarly, studies in developing countries by Le and Nguyen (2020) and Sahue (2019) highlight the effects of education on women's decision-making power and the reduction of domestic violence. In Turkey, research by Gulesci and Meyersson (2012) and Kirdar et al. (2009) demonstrates the negative effects of the 1997 education reform on early marriage and fertility. Erten and Keskin (2018, 2021) and Akyol and Kirdar (2022) have examined the impacts of education on domestic violence and labor market participation. My research contributes to this literature by analyzing a Women's Empowerment Index and attitudes toward domestic violence, encompassing various dynamics. Using 2013 and 2018 TDHS data and the Regression Discontinuity Design (RDD) methodology, I provide detailed evidence of the causal effects of the education reform on women's empowerment. My findings show that the 1997 reform significantly improved women's empowerment and attitudes toward domestic violence, thereby supporting and extending the conclusions of previous studies. This research highlights the multifaceted benefits of education on women's empowerment, emphasizing the importance of educational investments and context-specific policies.

The significance of this study for various stakeholders is multifaceted. Firstly, for women as individuals, higher education contributes to empowering dynamics in multiple ways, which is crucial both individually and socially. Additionally, increased education positively influences women's attitudes towards domestic violence, making them more aware of their rights and more resilient against such violence. The empowerment of women as individuals can also benefit their families and, most importantly, their children.

For policymakers, the study highlights the effectiveness of extending compulsory education in increasing educational attainment, especially in rural areas. This

underscores the role of education policies in reducing regional disparities and promoting equitable development. These findings can guide future policy decisions and emphasize the importance of evidence-based approaches. Academically, this study contributes to the literature on the social impacts of education reforms by providing a methodological reference for similar research. The use of fuzzy regression discontinuity design (RDD) and two-stage least squares (2SLS) methods offers a methodological foundation for studies in this field.

For non-governmental organizations, the findings support advocacy and project development efforts in the areas of gender equality and women's empowerment by providing concrete data to underpin their initiatives. From a societal perspective, increased educational attainment can foster cultural change regarding gender roles and equality, and promote economic development by enabling women to participate more actively in the workforce.

In conclusion, three additional years of compulsory education significantly improved women's empowerment and their attitudes towards domestic violence. These findings underscore the critical role of sustained investment in education for achieving gender equality and empowering women, contributing to broader social and economic development goals. Future research should explore the long-term effects of educational reforms on women's empowerment and develop strategies to enhance these positive outcomes.

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