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Author: Chris Gahagan

Author's Institution: Florida State University

Author's E-mail: cgahagan@fsu.edu

Author's Postal Address: Department of Political Science, P.O. Box 3062230, 113 Collegiate Loop, Tallahassee, Florida 32306-2160

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Breaking Barriers: How an International Treaty for Women Reduces the Size of the Informal Economy

Abstract

Prior research on the role the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) has improving women's outcomes has shown ratification results in increased political and social rights, yet no improvements in economic rights. I challenge prior findings by providing evidence that CEDAW improves women's economic rights by reducing gendered legal barriers to employment. I also demonstrate CEDAW has unexpected but desirable downstream consequences that further improve women's economic outcomes by facilitating movement from the informal to the formal economy. Through matching within a difference-in-differences design, I show ratifying countries experience a significant increase in women's equality of economic opportunity and a significant decrease in the size of the informal economy. These results hold under multiple robustness checks and placebo tests. By examining specific outcomes that are relevant to CEDAW, I offer greater insight into CEDAW's impact on women's economic outcomes than previous research has afforded.

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What effects international treaties have on domestic outcomes has long been debated by scholars of international relations. Some have argued that treaties matter for constraining state behavior (Simmons 2000; Simmons and Hopkins 2005), as opposed to simply screening out non-compliers ahead of time (Von Stein 2005), while others have argued that international treaties have mostly failed to produce any effects at all (Hoffman et al. 2022). Perhaps one of the most prominent areas where this debate takes place involves the signing of human rights treaties. Here, too, scholars are split on whether the ratification of human rights treaties improves outcomes (Fariss 2014; 2019) or if they are ineffectual (Hafner-Burton and Tsutsui 2007), resulting in little improvements to human rights protections (Cingranelli and Filippov 2018). Partially, this is an empirical question—and methodological advancements continue to provide us with new tools to gain more precise answers over previous approaches. Also, however, this is a question of the downstream implications that may arise due to these international agreements. In other words, even if countries are screening into human rights agreements, there may be important and overlooked consequences we are not fully considering. By accounting for these downstream effects, scholars and policymakers can appreciate the full scope of international agreements while avoiding the risks of understating the impact these agreements have on domestic outcomes.

Consider the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). CEDAW's stated goal is the elimination of discrimination against, and the promotion of equal rights for, women. CEDAW's aim is to bind states to empower women and put them on an equal playing field with men. Previous research investigating CEDAW's effectiveness has yielded mixed results, with findings pointing to an increase in political and social rights for women, but no discernible impact on women's economic rights (Englehart and Miller 2014; Hill 2010). Given this, it would appear that CEDAW has failed to help out women economically. However, I

contend that we may be underestimating CEDAW's impact on women's economic outcomes for three reasons.

First, previous research evaluating CEDAW's effectiveness often rely on broad measures of women's economic rights that aggregate both law and practice into a single indicator, making it unclear what is occurring within countries when scores change. Moreover, the underlying information source for these measures utilize US State Department reports, which tend to prioritize political and civil rights rather than economic rights. In contrast, examining outcome-specific measures that directly map on to CEDAW's goal of legal economic equality, enables a more precise test of CEDAW's effectiveness on economic improvements for women. Second, economic improvements for women may arise in ways that are not captured by indicators that use country-level expert reports found in previous research. Focusing solely on these indicators while overlooking specific outcomes relevant to the treaty can result in a limited understanding of CEDAW's far-reaching effects. Third, recent methodological advancements in time-series cross-sectional (TSCS) analyses gives researchers better causal leverage to investigate CEDAW's impact by enabling a design-based approach to address endogeneity concerns while accounting for variation in ratification timing across countries.

In short, by utilizing precise and easily interpretable measures that focus on women's legal economic rights, examining specific downstream consequences that are relevant to CEDAW, and leveraging modern methodological techniques, we gain greater insight into CEDAW's impact on women's economic outcomes than previous research has afforded.

This paper directly answers the question of CEDAW's role in improving women's economic outcomes by doing two things. First, I overturn conventional wisdom by providing evidence that CEDAW does what it is intended to do—improves women's economic rights by

reducing legal barriers to women's employment. Second, I demonstrate that CEDAW has unexpected by desirable downstream consequences. In particular, I show CEDAW ratification plays a meaningful role in reducing informal economic activity[1]—unregistered and untaxed legal activities deliberately concealed from public authorities—which often includes dangerous working conditions and increased rates of poverty and inequality (Bonnet, Vanek, and Chen 2019; Deléchat and Medina 2021; Malta et al. 2021). Although CEDAW's effect on the informal economy may work through a variety of causal channels, I argue one important mechanism is the aforementioned elimination of legal barriers to formal work. The removal of these barriers enables women, many of whom were previously forced to work informally, gain employment in the formal sector, which results in an overall decrease in the informal economy.

To test my argument, I incorporate matching within a difference-in-differences (DID) design that accounts for variation in the timing of CEDAW ratification for TSCS data recently developed by Imai, Kim, and Wang (2021). In the results section I show that after matching countries on treatment, outcome, and covariate histories, CEDAW ratification results in a modest but significant increase in the probability that women will not encounter gendered legal barriers to employment. I also demonstrate that CEDAW ratification leads to a significant decrease in the size of the informal economy by nearly half a percentage point of GDP.

These findings have important implications for countries, individuals, and scholars of international relations. At the country level, a decrease in informal economic activity implies workers move from the informal to the formal sector, which can lead to additional taxable revenue necessary for public goods provision. At the individual level, reducing work in the informal

[1] Also known as the shadow economy or underground economy.

economy, which is estimated to consist of over 2 billion people, is normatively desirable as it can lead to less dangerous work and lower rates of poverty and inequality. This is especially important for reducing gender disparities in the workplace and promoting the equitable development of women since women are underrepresented in the formal economy (World Bank 2022a) and overrepresented in the informal economy (Deléchat and Medina 2021). Lastly, for scholars of international relations, I demonstrate that CEDAW ratification is doing what it is meant to do by lowering barriers to women's formal employment, while also generating unexpected but desirable spillover effects that further improve women's economic outcomes. By examining specific outcomes relevant to CEDAW, this work provides clarity and furthers our understanding about the effects of international law on domestic outcomes.

Human Rights and Treaty Ratification

The constraining versus screening nature of international agreements has long been debated within international relations. While some scholars argue that international agreements can exert independent influence on state behavior (Simmons 2000; Simmons and Hopkins 2005), others argue that states adhere to international agreements due to endogenous expectations about future compliance (Downs, Rocke, and Barsoom 1996). The conclusion of these latter arguments is that treaties tend to "screen out" non-compliers ahead of time, resulting in little to no change in state behavior, leaving those who ratify essentially in the same position had the treaty never existed (Von Stein 2005).

Previous work on human rights treaties calls this reasoning into question. If screening effects were the only reason states choose to ratify international treaties, then as Vreeland (2008) notes, we would expect to observe high or perfect compliance. However, Hathaway (2001) finds that countries with some of the worst human rights records often ratify human rights treaties at

very high rates. One answer to this puzzle points to the political institutions present in autocratic countries (Vreeland 2008), while alternative explanations propose a "window dressing" argument (Hafner-Burton and Tsutsui 2005). In the latter scenario, due to normative expectations around human rights, countries ratify treaties to appease international actors while never having the intention nor the capacity to improve their practices. The end result of such scenarios gives the impression that human rights treaties are ineffectual and have failed to produce their intended effects.

The possibility of an appeasement type of scenario is especially high concerning CEDAW, given that out of 194 U.N. member countries, 187 have ratified the treaty (Verveer and de Silva de Alwis 2021). However, previous work by Englehart and Miller (2014) and Hill (2010) calls the window-dressing scenario into question. Both works find CEDAW ratification leads to positive improvements for women's political and social rights, however, no substantial effect on improving women's economic rights.

Given these findings, it would appear CEDAW has failed to help out women economically. However, I contend we may be misinterpreting CEDAW's full impact on women's economic rights due to the coarse nature of previously used indicators, as well as overlooking ratification's downstream consequences that improve women's economic outcomes. In particular, I argue CEDAW ratification plays a meaningful role in improving women's economic rights by addressing gendered legal barriers to women's employment while also having unexpected but desirable downstream consequences on women's participation in the informal economy.

CEDAW, Exclusion, and Women's Economic Rights

Women are often the largest excluded group in the world, having on average three-quarters the rights of men (Hyland, Djankov, and Goldberg 2020). Addressing exclusionary barriers is vital

for women's development since these policies can result in negative economic outcomes including large gender gaps in labor force participation (Lagarde 2014), high levels of employment in the informal sector (Farhan et al. 2016), and all around less favorable outcomes in the formal labor market (Hyland, Djankov, and Goldberg 2020). Articles 11 and 13 of CEDAW specifically address exclusionary policies by prohibiting discrimination against women in the fields of employment, ensuring women a right to work, equal employment opportunities, free choice of profession, equal benefits, and safe working conditions (United Nations General Assembly 1979). When countries ratify CEDAW, they publicly commit to both domestic and international audiences that they are behaving in line with a new set of norms to promote women's rights. After ratification, countries bind themselves to put both the treaty provisions into practice while also promising to submit periodic reports on steps taken to comply with their obligations (United Nations n.d.). This commitment opens countries to both coordination and monitoring activities, enabling international organizations (IOs) and non-governmental organizations (NGOs) to hold governments accountable and ensure they follow the rule of law through a variety of strategies such as educational programs, public naming and shaming, and domestic judicial processes.

An example of this process can be seen in Nepal, which ratified CEDAW in 1991. Although the Nepal Treaty Act of 1990 states that in the case of conflict, international treaty provisions supersede existing domestic laws, many members of the judiciary were unaware of their country's obligations under CEDAW. This ignorance often resulted in discriminatory rulings against women such as in the Meera Dhungana case of 1994, in which judges referenced social norms and value systems in their refusal to provide equal property rights (Pandey 2013).

Witnessing the disconnect between Nepal's CEDAW obligations and domestic legal outcomes, the NGO "Pro Public" worked to hold the government of Nepal accountable by filing

petitions challenging discriminatory laws on the basis of CEDAW, as well as educational programs informing the judiciary of Nepal's legal obligations under the treaty (Pandey 2013). These programs, in tandem with legal challenges, worked to strike down many Nepalese laws and customs that were found to be discriminatory against women. In fact, after completing the program, the same judges in the aforementioned Meera Dhungana case reversed course and ruled in favor of women's economic rights in a later case involving recruitment discrimination against Royal Nepal Airlines Corporation (Pandey 2013).[2]

Although anecdotal, the above scenario offers one example how these processes help governments fulfill their obligations under CEDAW and promote women's equality.[3] Importantly, these processes are not limited to a select group of developing economies. Across a wide variety of countries, CEDAW has been credited as a major contributing force of reform (Hyland, Djankov, and Goldberg 2020), including overturning discriminatory practices aimed at women in Japan (Working Women's Network n.d.) and reforms to civil codes in Türkiye (Akyol 2014).

Given that many organizations across a variety of countries have cited CEDAW as a force of positive reform, it is puzzling that we do not see this relationship hold in quantitative analyses testing CEDAW's impact on women's economic rights. I argue that, in addition to recent methodological advances that better facilitates causal identification of TSCS data, one possible reason is due to the coarser measures used in previous research.

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[2] See Reena Bajracharya v. His Majesty's Government of Nepal (May 2001)

[3] In the results section, I revisit the case of Nepal and demonstrate that its informal economy declined by 1.73 percentage points three years after CEDAW ratification.

When testing CEDAW's impact on women's economic rights, both Hill (2010), and Englehart and Miller (2014) employed indicators from the Cingranelli and Richards (CIRI) Human Rights Data Project. The CIRI measure, though frequently used in the human rights literature, is vulnerable to potential weaknesses that may obscure CEDAW's impact on women's economic rights. First, the CIRI data lacks estimates prior to 1981, the year in which CEDAW came into force, making it difficult to judge CEDAW's impact for early ratifiers since we do not have comparable data on women's rights prior to CEDAW's introduction. Second, the CIRI women's economic rights indicator aggregates legal provisions with their practical implementation into a single measure, making it difficult to pinpoint whether CEDAW's impact on women's economic reflect formal legal reforms, or shifts in enforcement and compliance. Third, the underlying information source for many of the CIRI measures comes from U.S. State Department reports, which tend to emphasize civil and political rights at the expense of economic, social, and cultural rights (Frederick et al. 2025). In short, due to the limited temporal coverage, the aggregation of law and practice into a single measure, as well as the underlying information source, I argue past research may be overlooking important variation that can shed light on whether CEDAW is helping out women economically.

In contrast to the coarse indicators used previously, this paper tests CEDAW's impact specifically on legal equality of economic opportunity between women and men utilizing a recently developed measure by the World Bank's Women, Business and the Law (WBL) database (World Bank 2022b). The WBL data addresses many of the shortcomings of previous indicators with an increased temporal range, as well as focusing squarely on equality of economic opportunity under the law. This approach enables a straightforward and clear way to measure whether countries are following a key obligation of CEDAW and enacting laws meant to improve women's economic

rights. Accounting for laws aimed at improving women's economic rights is important in itself, as previous research has shown that laws that impact women's ability to work can affect the share of women in paid and full-time work (Hallward-Driemeier and Gajigo 2015), as well as wage differences between men and women (Weichselbaumer and Winter-Ebmer 2007). Lastly, the WBL database's expanded temporal range, which starts in 1971 and covers 190 economies (Hyland, Djankov, and Goldberg 2020), is methodologically important. The increased timeframe enables measurement of women's legal economic equality prior to the introduction of CEDAW, ensuring variation is accounted for in early ratifying countries. In summary, by utilizing an arguably better measure with increased temporal range and an explicit focus on women's legal economic equality, I am able to test if CEDAW is doing what it is meant to do—improve women's economic outcomes. This leads to my first hypothesis:

H1: CEDAW ratifying countries will see an increase in the probability that women will not encounter gendered legal barriers to employment relative to countries that do not, or have not yet, ratified.

Importantly, advances brought on by ratification may lead to improvements for women that are not captured by traditional country-level indicators, thereby obscuring our interpretation of CEDAW's effectiveness. In other words, while these indicators are beneficial, exclusively focusing on these measures while overlooking specific outcomes relevant to CEDAW, runs the

risk of underestimating the full impact CEDAW has on improving women's lives.[4] In particular, I argue one important but overlooked dynamic is CEDAW's role reducing women's informal employment—which is often associated with poverty traps and increased inequality. When CEDAW reduces legal economic barriers for women, this results in positive spillover by facilitating women's movement out of the informal economy and into the formal workforce.

CEDAW and the Informal Economy

The worldwide informal economy is surprisingly large, consisting of roughly 60% of the global workforce (Deléchat and Medina 2021). High levels of informal employment often results in detrimental outcomes. At the country level, large informal economies can distort macroeconomic indicators on income and unemployment rates. These distortions result in incorrect economic estimates being sent to government officials and IOs, which in turn implement policies based on this incorrect information (Elgin and Oztunali 2012). For individuals, informal work is often associated with high rates of poverty, precariousness, and inequality. In a study examining 28 developing and emerging countries, the poverty rate of informal workers was found to be five times that of formal workers in eight countries, and over 10 times as much as formal

[4] Difficulties measuring gender equality and empowerment are subjects of intense debate. Arat (2015) argues that policies reflected in aggregate indicators of descriptive empowerment may help some women while at the same time falling short of empowering the majority. Attention to more specific indicators of economic well-being, such as gendered employment barriers faced by all women within a country, can address some of these concerns. However, these indicators may still mask fundamental disadvantages that persists despite these improvements.

workers in three countries (Bonnet, Vanek, and Chen 2019). Moreover, increased poverty rates are not limited to developing countries, as the same report investigating developed economies found poverty rates of informal workers were twice that of formal workers in 22 out of 27 countries (Bonnet, Vanek, and Chen 2019). Ultimately, a large informal economy acts as an obstacle to inclusive and sustainable growth, with increased poverty, inequality, precariousness, and dangerous working conditions for individuals, while also causing macroeconomic inefficiencies that lead many countries to grow well below their true potential (Georgieva 2021; La Porta and Shleifer 2008, 2014).

Historically, researchers studying the determinants of informal work often point to explanations such as an incongruence between formal and informal institutions , as well as what can be described as "exit" or "exclusion" related reasons (Perry et al. 2007; Tokman 2007b; Williams, Horodnic, and Windebank 2015). In the institutional incongruence perspective, informality increases because of non-alignment between formal and informal institutions for reasons such as a lack of trust in government or low 'tax morale'. Exit-related reasons, which are often relevant for relatively affluent groups, those in developed economies, and men, sees individuals and firms voluntary leave the formal economy due to high market entry costs, lack of formal market competition, high tax burdens, strict product or labor market regulations, and high levels of corruption or weak rule of law (Gërxhani 2004; Perry et al. 2007; Schneider and Enste 2000; Schneider and Williams 2013). Conversely, exclusion-related reasons, which are more pronounced in relatively deprived populations, those in developing economies, and women, sees workers desire employment in the formal sector but are excluded from doing so, due to legal or employment barriers, reduced labor protections, or a lack of property rights (Devine 2021; Gurtoo and Williams 2009).

Exclusionary factors include gendered expectations around household labor and child-rearing, constraints on women's education or skills accumulation, formal employment restrictions, limits on private property rights, and legally sanctioned workplace discrimination (Chant and Pedwell 2008; Elgin and Elveren 2021). Such factors not only heighten women's susceptibility to layoffs during economic crises (Ghosh 2013) but also limit their formal-sector opportunities. Consequently, women tend to be underrepresented in the formal economy (World Bank 2022a) and overrepresented in the informal economy (Deléchat and Medina 2021)

I argue that CEDAW, with its emphasis on political, social, and economic equality, helps mitigate many of these exclusionary channels to informality. In the absence of formal economic rights, simply increasing female labor force participation can increase the size of the informal economy (Özgür, Elgin, and Elveren 2021), thereby eroding gains in gender wage equality (Elgin and Elveren 2021). CEDAW expands women's legal protections, which make it more difficult for employers to dismiss women during economic downturns and enhances women's access to formal employment opportunities. This results in positive spillover that leads to reduced incentives to work informally and, consequently, an overall decrease in the size of a country's informal economy.

Transitioning women from the informal to the formal economy brings about many positive outcomes that contributes to the overall wellbeing and development of women. First, formal employment can act as a bulwark against economic shocks that informal workers are especially suspectable to (Chen 2023). Moreover, previous research has shown moving women into the formal labor force generates positive normative outcomes such as boosting influence at the individual level resulting in more sway within the family (Beegle, Frankenberg, and Thomas 2001; Iversen and Rosenbluth 2006), at the societal level resulting in more egalitarian beliefs about

gender relations (Thornton, Alwin, and Camburn 1983) and at the economic level by creating dense networks that boost their economic importance, compelling governments to take their interests into account (Ross 2008). Importantly, many of these benefits require access to formally recognized employment relations, which are by nature absent in the informal economy (Tokman 2007a).

In summary, throughout many parts of the world, women are underrepresented in the formal economy and overrepresented in the informal economy, often due to exclusionary barriers to employment. If CEDAW ratification is eliminating employment barriers for women, as Hypothesis 1 argues, then we should also expect CEDAW to have downstream consequences on the informal economy. When women face fewer constraints to formal work, they have reduced incentives to work informally, resulting in an overall decrease in informal economic activity. Therefore, I propose the following hypothesis:

H2: CEDAW ratifying countries will experience a reduction in the size of the informal economy relative to countries that do not, or have not yet, ratified.

A Design Based Approach to Address Endogeneity Concerns

Previous research has shown that estimating outcomes for countries who ratify international treaties compared to countries who never ratify can lead to biased results (Hill 2010). To address potential bias and endogeneity concerns, I match countries on similar observable characteristics and perform a difference-in-differences analysis to estimate CEDAW's effect on equality of economic opportunity for women, as well as on the size of the informal economy. In

particular, I utilize a time-series cross-sectional sample of 145 countries from 1978–2016,[5] with the unit of observation being a country-year. To account for possible selection effects, I collect numerous potentially confounding covariates during the matching process that might affect CEDAW ratification, women's legal right to employment, or the size of the informal economy. Countries that ratify CEDAW are matched with similar countries that did not, or had not yet ratified, on covariate, treatment, and outcome histories. After matching, I perform a difference-in-difference analysis for the change in the share of women able to obtain work on an equal basis with men (H1), or the change in the size of the informal economy (H2) for ratifying $country_i$, compared to countries that had not yet ratified in the same time period. The matching and difference-in-differences method employed here addresses endogeneity concerns by design, controls for unobserved confounders, and aids in causal inference by comparing the changes in outcomes before and after treatment for both treated and control groups.

Importantly, I contend that CEDAW's effect on reducing employment barriers for women and on the size of informal economy should not be expected to happen immediately for multiple reasons. First, and perhaps most importantly, domestic litigation against discriminatory laws can take years to resolve in a country's legal system. Second, the timing of periodic national reports means that monitoring, coordination, and program implementation from both IOs and NGOs is delayed until well after a country ratifies CEDAW. Third, the often slow-moving nature of many state bureaucracies can result in delayed policy implementation, thereby delaying any effects attributed to CEDAW until years later. In other words, policy change due to CEDAW ratification may realistically need time to penetrate the courts, legislatures, bureaucracies, and society before

[5] To date, no country has ratified CEDAW after 2015.

we start to see its effects. Due to these dynamics, I argue we should expect a delay of at least a few years before changes due to CEDAW ratification become observable. In the analyses below, I opt for a four-year post-treatment period to highlight both the immediate and short-term effect of ratifying CEDAW on reducing barriers to women's employment and on the informal economy.[6]

Dependent Variables

The outcome of interest for H1 is a binary indicator measuring legal restrictions for women in the workforce from the World Bank's Women, Business and the Law database. The WBL database captures legal inequality that affects women's economic opportunities by sending out questionnaires to over 2,000 respondents, consisting of lawyers, judges, academics, and members of civil society organizations, knowledgeable in aspects of family, labor, and criminal law (Hyland, Djankov, and Goldberg 2020).[7] As noted above, a particular strength of the WBL data its focus on equality of economic opportunity under the law, with previous research offering evidence that higher WBL scores correlate to better labor market outcomes for women (Hyland, Djankov, and Goldberg 2020). Additionally, the scope and depth of the WBL data, which includes 190 economies from 1971 onward, allows me to not only examine the parallel trends assumption needed for a difference-in-differences approach, but ensures important variation for early ratifiers

[6] A four-year post-treatment window is, admittedly, an arbitrary decision. I decided on this window to show that any effect, if found, isn't temporary but rather a lasting impact due to CEDAW ratification. Importantly, in Online Appendix E (pp.17–19), I show that results remain unchanged whether opting for a three, four, or five year post-treatment window.

[7] After questionnaires are returned, a team of legal experts at the World Bank performs a verification check to make sure the responses agree with legislative texts (Hyland et al., 2020).

are included in the analysis. This binary variable is coded 1 if there are no legal restrictions towards women in the workforce, and 0 if any of the following exist*: "a husband can prevent his wife from working; or permission or additional documentation is required for a woman to work but not a man; or it is considered a form of disobedience with legal consequences, such as loss of maintenance, for a woman to work contrary to her husband's wishes or the interests of the family*." (World Bank 2022b).[8]

The outcome of interest for H2 is the size of a country's informal economy developed by Elgin and Oztunali (2012)[9] and expanded upon by (Özgür, Elgin, and Elveren 2021). To produce estimates of the informal economy, the authors use a deterministic general equilibrium (DGE) model in which representative households choose between two productive technologies, formal and informal. By matching various macroeconomic proxies, the authors solve the model and generate an estimate of the size of the informal economy, operationalized as a percentage of official GDP, for a given country-year.[10] The estimated size of a country's informal economy varies

[8] Descriptive statistics for both dependent variables, as well as all variables used in the model(s), can be found in Online Appendix A (pp.1–4).

[9] The DGE model used by Elgin and Oztunali (2012), along with the MIMIC model (Schneider, Buehn, and Montenegro 2010), are two prominent datasets employed by various international organizations such as the World Bank and the IMF when studying informal economies. The original data set utilizing the Elgin and Oztunali (2012) informal economy data was borrowed from Blanton, Early, and Peksen (2018).

[10] See Elgin and Oztunali (2012) for a detailed description of the model.

greatly in the sample from a low of 7.96% of GDP for Switzerland in 2012, to a high of 81.69% of GDP for Georgia in 1994.[11]

Treatment Variable

To estimate the effects of CEDAW ratification, I incorporated Hill and Watson's (2019) coding of CEDAW ratification as my treatment variable whereby countries take a value of 1 the year CEDAW is ratified (and every year after) and 0 otherwise. As mentioned previously, I expect the results of ratification to not be immediate due to the slow moving nature of legal challenges and policy change, as well as the time needed for these changes to permeate through society. Given this, I opt for a post-treatment window of four years to estimate the average treatment effect on the treated (ATT). In other words, I investigate the effect of ratification on changes in the size of a country's informal economy compared to similarly matched countries who had not ratified the treaty at the time of treatment onset.

Covariates for Matching

Previous research suggests an association between regime type or commitment to the rule of law with women's economic rights, ratification of human rights treaties, and the size of the informal economy (Hill and Watson 2019; Richards and Gelleny 2007; Teobaldelli and Schneider 2013; Vreeland 2008). To address these potential confounding covariates, I matched and balanced countries on the Varieties of Democracy (VDEM) Rule of Law index (Coppedge et al. 2020) as well as the Polity 2 index from the Polity V database developed by Marshall and Gurr (2022).

[11] Ideally, I would test my theory using informal economic activity by gender. Unfortunately, these data are not only scarce, but reliable estimates do not begin until the mid-to-late 2000s, well after most countries ratified CEDAW.

VDEM's rule of law index scores countries on an interval from 0 to 1 and asks to what extent laws are enforced and if the actions of government officials comply with the law.[12] The Polity 2 index measures countries based on regime type, spanning from -10 (most autocratic) to +10 (most democratic).

Additionally, economic indicators such as GDP per capita, foreign direct investment (FDI), trade flows, unemployment rates, inflation rates, female labor force participation, and official development assistance (ODA), could plausibly influence formal barriers towards women, the size of the informal economy, or CEDAW ratification (Deléchat and Medina 2021; Hill 2010; Richards and Gelleny 2007). To account for these possible confounders, I matched countries on a variety of economic indicators gathered from the World Bank's World Development Indicators (WDI) database (World Bank 2022c) including the log of GDP per capita, the log of a country's trade (% of GDP), inflation (annual %), unemployment (% total labor force, ILO estimate), foreign direct

[12] There are debates in the literature whether corruption impacts the informal economy. Schneider and Enste (2000) mention that some findings show corruption matters for increasing informality, while Williams (2017) finds no association. For the countries in my sample, VDEM's rule of law and corruption measures are highly correlated, with a Pearson coefficient of -0.9. Due to possible multicollinearity, I omitted VDEM's corruption measure from the analysis. However, in Online Appendix E.1 (p. 14), I show that results remain similar, albeit delayed by one year, with both corruption and rule of law variables included in the analysis.

investment (net inflows, % to GDP), the signed-log of net ODA received per capita, and female labor force participation rates (% of population, ILO estimate)[13].

On top of general economic indicators, previous work has shown that a country's economic orientation, whether geared towards oil production or export-oriented manufacturing, can affect formal employment opportunities for women. On the one hand, Ross (2008) argues that the sudden increase in wealth brought on by oil or other minerals causes a rise in the real exchange rate. This change transforms the economy away from traded sectors that traditionally employ women towards nontraded sectors that traditionally employ men. On the other hand, countries with large export-oriented manufacturing sectors historically employ women in occupations such as textiles, garments, plastics, and electronic goods. Sales to a global market can cause these industries to experience rapid growth, increasing labor demands that may confound the effects of CEDAW ratification. To control for these dynamics, I match and balance countries on indicators from the World Bank's WDI database for a country's reliance on oil rents (% of GDP) as well as a country's manufactures exports (% merchandise exports) (World Bank 2022c).

An additional strand of research has found that violent conflict can affect both human rights and informality since conflict can lead to more repression by governments and economic instability

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[13] Using ILO estimates on female labor force participation would be an ideal outcome variable to test whether CEDAW is helping women economically. Unfortunately, ILO data does not start until 1990, which would omit over half of the ratifying countries in my sample. However, the expansive temporal range of informal economy data offers a way to test this indirectly. Consequently, I opt to use the ILO data as a control variable in the analysis due to `PanelMatch`'s ability to match on missingness.

(Blanton, Early, and Peksen 2018; Hafner-Burton and Tsutsui 2007; Hill 2010). To make sure countries are matched and weighted on this potential confounder, I followed Blanton, Early, and Peksen (2018) and incorporated their Conflict Intensity indicator originating from the UCDP/PRIO Armed Conflict Dataset (Gleditsch et al. 2002).

In addition to the economic, conflict, and regime-type characteristics above, ratifying countries can have vast differences in their respect for women's rights and inclusion in society, as well as the robustness of civil societies that may play an active role in promoting women's rights. At face value, we would expect those countries that place a high value on women's civil liberties to not only be more likely to ratify CEDAW but also have fewer legal barriers to formal work for women. This in turn will confound any relationship between CEDAW ratification and legal barriers to formal work for women, as well as CEDAW's impact on the informal economy. To account for this, I incorporate measures on women's rights and the strength of civil society into the matching process using the Women's Civil Liberties (WCL) index and the Core Civil Society Index from the Varieties of Democracy (VDEM) dataset (Coppedge et al. 2020). The WCL index from VDEM asks whether women have the ability to make meaningful decisions in key areas of their lives, such as freedom of domestic movement, freedom from forced labor, property rights, and access to justice (Coppedge et al. 2020), with scores ranging on an interval from 0 (low) to 1 (high). VDEM's Civil Society Index measures the robustness of a country's civil society and is measured on an interval scale similar to the WCL index. Additionally, I use an indicator measuring women's access to credit from the World Bank's WBL index (World Bank 2022b) which is a binary indicator measuring if discrimination by creditors is legally prohibited based on gender.

Lastly, a potentially confounding scenario may occur if countries are ratifying multiple human rights treaties at once, thereby isolating CEDAW's effect on the informal economy

difficult. Although a limited amount of treaty bundling occurs in the sample; to address this possibility, I created an indicator variable that takes the value of one (1) for countries that ratified CEDAW and any other prominent human rights treaty at the same time and zero (0) otherwise. This bundling variable is incorporated into the matching method to control for any confounding relationships that may arise.[14]

Identification Strategy

To estimate the ATT, I use Mahalanobis Distance Matching (MDM) to match treated countries to their three nearest control countries based on lagged values of a country's dependent variable, their treatment status, and lagged covariate histories for the three years prior to treatment onset.[15] To illustrate the matching process for CEDAW's impact on the informal economy, we can return to our example of Nepal, which ratified CEDAW in 1991. Given the pre-treatment lag specification of three years, potential matches for Nepal must: i) have not ratified CEDAW in the three years prior to 1991; ii) have similarly sized informal economies as Nepal form 1988–1990; iii) look similar on the observable covariates mentioned above for the years 1988–1990. In this

[14] In particular, 31 countries were found to have bundled CEDAW with another popular human rights treaty in the same year. The list of treaties that could be bundled with CEDAW include CAT, CERD, CMW, CRC, CRPD, ICCPR, and ICESCR. In Online Appendix D.2 (p. 11), I show that results are not being driven by these countries who are bundling multiple human rights treaties at once.

[15] In Online Appendix E.2 (p.15), I show the results found below hold when employing alternative matching specifications. Covariate balance across all matching specifications can be found in Online Appendix B (pp. 5–6).

instance, the control units that are most similar to Nepal are Mauritania, Côte d'Ivoire, and Burundi.[16] The matching process resulted in 123 successful matches for both analyses with the three closest control countries determined via the MDM algorithm.

After matching, I performed a difference-in-differences analysis[17] on treated and control countries to test CEDAW's effect on the size of the informal economy, generating standard errors via block bootstrapping with 10,000 iterations. Matching on potentially confounding covariates, treatment history, and a lagged dependent variable helps address endogeneity concerns, while utilizing block bootstrapping addresses concerns surrounding autocorrelation. Furthermore, in a difference-in-differences analysis wherein units within groups are observed in multiple time periods, the dependent variable is estimated when the average change in the control group is subtracted from the average change in the treatment group (Wooldridge 2007). This process removes biases between treatment and control groups due to both differences between the groups as well as over time biases resulting from different trends.[18]

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[16] Given that no country has ratified and then exited CEDAW, any country that had ratified CEDAW prior to 1991 would not be an eligible match for Nepal. Additionally, un-treated countries have the opportunity to act as control matches for multiple treated countries. For example, Mauritania, which did not ratify CEDAW until 2001, is selected as one of three control countries for both Nepal (which ratified in 1991) and Algeria (which ratified in 1996). For an in-depth explanation of the `PanelMatch` matching process, see (Imai, Kim, and Wang 2021).

[17] Performed via the R package `PanelMatch` developed by Imai, Kim, and Wang (2021).

[18] Previous research by Goodman-Bacon (2021) and others have pointed out issues that can occur with weights in a staggered treatment difference-in-differences analyses. However, the

The Parallel Trends Assumption

An important step to obtain causal identification in a difference-in-differences analysis is satisfying the parallel-trends assumption. In many practical applications of TSCS data, the chance for unobserved confounders is high, even after conditioning on treatment, outcome, and covariate histories, thereby making it difficult to satisfy the unconfoundedness assumption and threatening causal inference. However, adopting the parallel trends assumption as our identifying assumption allows us to have more confidence that the treated and control groups were trending in a similar fashion prior to treatment onset, such that differences between the two groups can be plausibly attributed to the treatment itself. In other words, conditional on covariates, in the absence of treatment, outcomes among the treated units would have been the same, on average, as outcomes among the control units.

While there is no way to observe the counterfactual needed to fully test the parallel trends assumption in TSCS data, in Online Appendix B.3 (p. 7) I show that the difference in pre-treatment trends between control and treatment groups is both small and consistent over time, adding confidence that the parallel trends assumption holds. Additionally, I run multiple placebo tests including advancing ratification timing by one, two, and three years, as well as examining the change in outcome at time t-1, compared to other pretreatment periods in the lag window (see Online Appendix C, pp. 8–9). All placebo tests report insignificant results. If there were pre-treatment differences that violate the parallel trends assumption, we would expect these placebo tests to be significant. Finding a null effect before treatment occurs increases our confidence that

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`PanelMatch` package by Imai, Kim, and Wang (2021) takes this into consideration with the flexible weighting estimator and matching on covariates.

there are no significant pre-treatment differences occurring between groups. Lastly, while missing confounders in TSCS data is always a possibility, if we accept the parallel trends assumption, and observe that trends in the outcome variable of interest are indeed parallel between treated and control groups, then unobserved confounders should not be a threat to causal identification.

Results

Is CEDAW doing what it is meant to do regarding women's economic rights? As a reminder, past research has found that CEDAW ratification leads to improvements in political and social rights for women, yet no improvements in economic rights for women , which is surprising given that CEDAW is often cited as a driver of economic reforms for women. I argue that due to the aggregation of law and practice into a single indicator, the underlying information source of these indicators, and their limited temporal span, previous research has overlooked important variation that masks CEDAW's impact on women's economic rights. By employing an arguably better measure with a broader temporal scope and an explicit emphasis on women's legal economic equality, we can more effectively assess whether CEDAW is doing what it is meant to do—improve women's economic rights.

Figure 1 presents the results of a difference-in-differences analysis between treated countries minus their matched control countries, giving us a counterfactual comparison of the effects of CEDAW ratification. At around three years after ratification CEDAW accounts for a modest but statistically significant increase of about 6.5 percentage points in the probability that women do not encounter gendered legal barriers to employment, offering support for Hypothesis 1. Moreover, we can see that this effect is not a singular occurrence, but rather accumulates over time, continuing its upward trajectory throughout the remainder of the post-treatment window. As I argue above, this is likely due to the time it takes for domestic litigation to overturn discriminatory

laws, delays in reporting that prompt monitoring and coordination activities from IGOs and NGOs, as well as the slow moving nature of bureaucracies and legislative systems that can result in delayed policy implementation. Nevertheless, the results below overturn conventional wisdom and offers evidence that CEDAW is in fact helping to improve economic rights for women.

[FIGURE 1 ABOUT HERE]

It's important to emphasize that legal advancements brought on by CEDAW can have an immediate impact on women's economic outcomes, such as minimizing the gender wage gap (Englehart and Miller 2014; Hill 2010; Weichselbaumer and Winter-Ebmer 2007), and increasing women's share of paid and full time employment (Hallward-Driemeier and Gajigo 2015). However, I argue that CEDAW also has unexpected but desirable downstream consequences that improve women's economic outcomes.

Due to the elimination of legal employment barriers, women face fewer constraints to formal employment, which in turn reduces incentives to work informally, leading to an overall decrease in the informal economy. Figure 2 shows that for those countries who ratify CEDAW, there is a significant reduction in the size of the informal economy compared to control countries, giving support to Hypothesis 2. Similar to the previous analysis, these estimates are the difference between treated countries minus their matched control countries. Starting at three years after ratification, CEDAW accounts for a decrease in the size of the informal economy by just under a half of a percentage point, with an ATT of -0.43, and continues to play a role in shrinking the informal economy throughout the remainder of the post treatment window.

[FIGURE 2 ABOUT HERE]

For a substantive illustration, consider our example of Nepal from earlier. According to the World Bank's World Development Indicators (World Bank 2022c), Nepal's informal economy was estimated to be 44.66% of 3.9 billion in GDP (current US$) in 1991, the year Nepal ratified CEDAW. In the three years following ratification, Nepal's economy ebbed and flowed, eventually growing to over 4 billion in GDP (current US$) in 1994, yet the size of the informal economy decreased by 1.73 percentage points to 42.93% of GDP. Although this may seem like a modest reduction at first glance, compared to the counterfactual scenario in which Nepal remains on the same path prior to CEDAW ratification, this reduction equates to nearly $70 million in economic activity shifting from the informal to the formal sector, a sizeable sum for a country in which the GDP per capita in 1994 was $186.6 USD (World Bank 2022c).[19] While this shift has the potential to expand the tax base and help with public goods provision, its importance goes beyond fiscal concerns alone. Transitioning Nepalese women, who are disproportionately employed in informal work, into formal employment also means greater access to legal and social protections, greater resilience to economic shocks, and decreased gender and health inequalities.

Nepal's modest reduction could plausibly be attributed to the scenario mentioned previously—many in the judiciary were unaware of CEDAW's provisions and failed to enforce their obligations immediately. However, we also see sizable decreases in the informal economy in many other countries throughout the world shortly after ratification. For example, looking at the same period from 1978 to 2016, the average informal economy size for countries in sub-Saharan

[19] Author's own calculations.

Africa is roughly 41% of GDP, while in Latin America and the Caribbean the average is close to 42% of GDP. Many of the countries in these regions started out with larger informal economies compared to some of their wealthier counterparts. Yet, we also see comparably larger reductions in the three years after CEDAW ratification. Looking at OECD member countries,[20] the largest reduction in informality three years after ratification occurred in Portugal, which saw a decrease of 1.5 percentage points in the size of the informal economy. While this is undoubtedly a large decrease, especially for an OECD country, it is less than half the size of the decrease experienced by Mozambique (3.81 percentage points) and the Republic of Congo (3.75 percentage points). Similar outcomes can be found in Latin America and the Caribbean, where countries such as Nicaragua and Haiti experienced decreases in the size of their informal economies of 2.72 and 2.71 percentage points, respectively.

As I mentioned above, while countries ratify CEDAW for a variety of reasons, including improving women's economic rights, the potential effects on informal employment are more than likely not a core issue driving ratification decisions. Rather, by increasing equality of economic opportunity for women, CEDAW ratification results in downstream consequences that encourage women to move out of the informal economy and into the formal workforce, which comes with safer working conditions, better pay, and less precariousness. In other words, rather than ratifying CEDAW in an attempt to clampdown on the informal economy, I argue the mechanism at play is the expansion of formal rights for women, which in turn creates a space where women can apply

[20] In the sample, OECD countries were considered as those members belonging to the organization prior to the UNGA's adoption of CEDAW in 1979.

for formal economic opportunities.[21] Given the continued challenges that many countries face at to this day, seeing a meaningful effect on the size of the informal economy within the first few years after ratification is a testament to the important, yet often overlooked, downstream consequences of international treaties. Recognizing these positive spillover effects furthers our understanding of the role international agreements have on domestic outcomes and offers evidence for one way through which CEDAW in particular improves women's economic situation.

Ideally, I would be able to test my claims using either data on formal economic participation or informal economic activity by gender. However, as noted above, these data are both limited in availability and temporally constrained, making it difficult to examine CEDAW's impact during the time when most countries were ratifying the treaty. Given women's disproportionate representation in informal employment, utilizing the size of the informal economy allows me to indirectly examine CEDAW's impact on women's economic outcomes. Even with this indirect approach, I argue that the results presented should nonetheless increase our confidence in my argument. It seems highly unlikely that a treaty mandating legal and regulatory reforms to advance women's rights—thereby addressing many exclusionary reasons for informal work—would result in men leaving the informal economy, especially given that men often engage in informal work due to voluntary, exit-channel reasons.

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[21] Ideally, a causal mediation analysis would be insightful to shed light on my proposed mechanism. Unfortunately, the nature of my data and treatment assignment does not satisfy sequential ignorability or unconfoundedness assumptions to conduct such an analysis.

Robustness Checks and Addressing Alternative Explanations

While the analyses above offer evidence that CEDAW ratification plays an important role in lowering informal economic activity, it is prudent to test the robustness of the findings and try to rule out plausible alternative explanations for the same results. In this section and the associated analyses in Online Appendices D–F (pp. 10–21), I address several of these scenarios including, but not limited to, different modeling specifications, endogeneity concerns, rival explanations, and CEDAW's role on a broader range of women's economic rights.[22]

To address endogeneity concerns, I perform additional tests to see if countries with high levels of gender inclusion or respect for women's civil liberties prior to ratification, as well as countries with large informal economies, are leading countries to ratify CEDAW (see Online Appendix D.4, p. 13). While many of these variables are controlled for in the main analyses,[23] the results for the robustness checks are insignificant. High levels of informality, high levels of gender inclusion, and high levels of women's civil liberties do not lead to CEDAW ratification, offering greater confidence in the findings above. To address concerns around model specification, I conduct additional analyses extending the pre-treatment lag lengths in the matching process,

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[22] In Online Appendix F.1 (p. 21) I show CEDAW ratification leads to a small, but significant, increase on a broad measure of economic rights for women that encompasses aspects such as women's mobility, the workplace, pay, marriage, parenthood, entrepreneurship, assets, and pensions using the World Bank's Women, Business and the Law index.

[23] Gender inclusion was left out of the analyses due to high correlation with VDEM's women's civil liberties variable (>0.7). In Online Appendix E.3 (p. 16) I show that results remained essentially unchanged with this variable included.

incorporating different matching methods, extending the post-treatment window, as well as different methods for generating standard errors (see Online Appendix E, pp. 14–20). The analyses for these additional tests show the results are not sensitive to the modeling specification and remain essentially unchanged from the main analysis.[24]

Additionally, my findings hold up against multiple rival alternative explanations. For example, a plausible alternative explanation is that the results found are not due to CEDAW ratification, but rather are the product of reform-minded governments aiming to advance legislation that promotes women's rights once they come into power. This scenario could involve these governments enacting domestic legislation at or near the same time a country ratifies CEDAW, thereby causing the results I find. To test this possibility, I created a variable from the V-Party dataset (Lindberg et al. 2022) that takes a value of 1 if a party moves into power in a given country, thereby becoming Head of Government, and strongly supports the equal participation of women in the labor market, and 0 otherwise. If the reform-minded governments explanation is correct, we should expect to see the results above being driven by this subset of countries. In other words, this approach addresses the possibility of countries that are on the threshold of eliminating formal barriers because of newly elected, reform-minded governments coming into power with a desire to increase women's labor participation. In Online Appendix D.2 (p.11) I show that CEDAW ratification has a statistically insignificant effect on the size of the informal economy for the subset of these cases, while still causing a significant reduction in the size of the informal economy for the subset of countries with non-reform minded governments.

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[24] The one exception occurs when extending the pre-treatment lag lengths from three to four years. In this case, CEDAW's effect on the informal economy becomes significant at t+4 instead of t+3.

Alternative Human Rights Treaties and International Signaling

Finally, another alternative explanation is that ratifying any prominent human rights treaty, rather than CEDAW specifically, leads to a reduction in the informal economy. In this scenario, treaty ratification acts as a signaling device to international actors that a government is committing to follow the rule of law while embracing a new set of norms around protecting individual rights. These signals may be attractive to foreign investors, potentially boosting trade flows, official development assistance, or FDI, which in turn reduces the informal economy. Simmons (2000) lends credibility to this argument, showing that countries adopt restrictive IMF Article VIII provisions to as a signaling mechanism to attract international investment.

To address these rival explanations, I perform multiple additional analyses. First, I show that CEDAW ratifying countries do not see a measurable increase in VDEM's *rule of law* indicator compared to matched control countries (see Online Appendix D.3, p. 12). This result alleviates concerns that CEDAW is coinciding with broader legal reforms rather than the targeted reforms aimed at improving women's rights.[25]

Second, I show that CEDAW ratifying countries do not experience a statistically significant increase for a variety of economic indicators including GDP per capita, trade flows, FDI, or official development assistance compared to their matched controls (see Online Appendix D.3, p. 12). This result alleviates concerns that countries are ratifying CEDAW specifically to attract economic investment, which then impacts the informal economy.

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[25] As I note above, VDEM's rule of law indicator is used in the matching method for both hypotheses tested.

Third, I perform multiple placebo tests using ratification data for three other prominent human rights treaties—the Convention Against Torture (CAT), the International Covenant on Civil and Political Rights (ICCPR), and the International Covenant on Economic, Social, and Cultural Rights (ICESCR)—to assess their impact on the size of the informal economy. The matching and difference-in-differences estimates for each of these treaties can be seen in figure 3.

[FIGURE 3 ABOUT HERE]

As the results show, none of the other prominent human rights treaties produce a significant impact on the size of the informal economy, which is exactly what we would expect in a placebo test of this nature. The results give further credibility to my theory that ratifying CEDAW—with its emphasis on expanding formal rights for women—rather than ratifying any prominent human rights treaty, is leading to a reduction in the informal economy.[26]

[26] In Online Appendix D.1 (p. 10) I show that other prominent human rights treaties such as the Convention on the Elimination of Racial Discrimination, Convention on the Protection of Migrant Workers, Convention on the Rights of the Child, and the Convention on the Rights of Persons with Disabilities also produce null effects on the informal economy. However, these treaties generate ambiguous predictions regarding the reasons behind their null effects, since they are intended to expand rights for vulnerable populations. This ambiguity makes them unsuitable for a placebo test of this nature. Data for these respective treaties were gathered from Von Stein (n.d.).

Conclusion

Do international agreements affect domestic outcomes? In this paper I shed light on this debate by highlighting two ways in which ratification of CEDAW improves women's economic standing. First, I challenge earlier findings from Englehart and Miller (2014) and Hill (2010) by demonstrating that CEDAW does what it is meant to do—improve women's economic outcomes. By leveraging variation in ratification timing, along with an arguably better measure that explicitly focuses on women's legal economic equality, I show that ratification accounts for a moderate but significant increase—approximately 6.5 percentage points—in the probability that women do not encounter gendered legal barriers to employment. Moreover, this effect appears to strengthen over time, offering evidence that CEDAW ratification results in durable reform that enhances women's equality of economic opportunity.

Second, I demonstrate that CEDAW has unexpected but desirable downstream consequences that increase women's economic wellbeing. By eliminating legal barriers, CEDAW reduces incentives for women to remain in the informal economy. Rather than triggering a crackdown on the informal sector, CEDAW expands women's legal rights, creating a space for women to access formal economic opportunities. The end result sees CEDAW ratifying countries experience a significant decrease of approximately half a percentage point of GDP in the size of the informal economy—an effect that also strengthens over time.

These findings matter because formal working arrangements are correlated with real welfare gains for women. Although Nepal's hurdles were used as an illustrative example, exclusionary barriers that relegate women to informal work are still stubbornly high in many parts of the world. Between 2004–2010, up to 95 percent of women workers in Southern Asia were employed informally (Heintz et al. 2015). In Sub-Saharan Africa, these shares have been reported to reach

94 percent (Malta et al. 2021). Simply increasing women's labor force participation will not lead to reduced informality unless exclusionary barriers to formal employment are removed. Formal working relationships are necessary to achieve the welfare gains required to improve women's economic standing, including better pay, safer working conditions, stronger protections during economic shocks, and reductions in poverty and inequality.

More broadly, this paper adds to the scientific study around the determinants of informal employment. By highlighting CEDAW's role in addressing exclusion-related pathways to informal work, I offer tangible evidence that removing legal economic barriers for women can act as a catalyst for reducing informality. While securing formal employment rights represents one dimension of CEDAW's agenda, future research should examine additional channels through which CEDAW shapes women's participation in the informal economy. In particular, CEDAW's mandate to eliminate gender discrimination in education, which previous research has shown is critical in explaining women's participation in the informal sector (Malta et al. 2021), remains a largely underexplored pathway linking international agreements to reductions in the informal economy. Moreover, future research should investigate whether other human rights treaties shape the informal economy. For instance, we might expect other treaties aimed at vulnerable populations, such as the Convention on the Protection of the Rights of All Migrant Workers, or the Convention on the Rights of the Child, to have similar effects as CEDAW. While the relatively smaller size of these groups might obscure detecting a macroeconomic effect on the informal economy, future studies employing fine-grained indicators or in-depth case studies could illuminate similar underlying mechanisms that work to reduce informality.

Lastly, this work highlights an important question scholars of international relations should be asking: What are the indirect effects of other international treaties? To my knowledge, this is

the first work that explicitly addresses the spillover effects of a human rights treaty on the size of the informal economy, highlighting an important but overlooked way these treaties indirectly impact domestic outcomes. However, this isn't the only work to investigate the observable implications that arise due to CEDAW ratification. Previous research has shown that CEDAW results in downstream improvements in health outcomes for both women and children including improved maternal and neonatal mortality rates (Gevrek and Middleton 2016), female adult mortality rates (Smith-Cannoy et al. 2020), as well as increases in female life expectancy (Tait et al. 2019). While some international treaties may have adverse effects, such as the ratification of the Convention Against Torture leading countries to develop "enhanced interrogation techniques" as a way to circumvent, rather than explicitly reject, their treaty obligations, recognizing their downstream consequences and observable implications enables us to appreciate the full extent, both positive and negative, these agreements have on domestic outcomes.

References

Akyol, Riada Asimovic. 2014. “Turkish Women’s Informal Work – a Complex Story.” *Al Jazeera*. https://www.aljazeera.com/opinions/2014/8/2/turkish-womens-informal-work-a-complex-story.

Arat, Zehra F. Kabasakal. 2015. “Feminisms, Women’s Rights, and the UN: Would Achieving Gender Equality Empower Women?” *American Political Science Review* 109(4): 674–89.

Beegle, Kathleen, Elizabeth Frankenberg, and Duncan Thomas. 2001. “Bargaining Power Within Couples and Use of Prenatal and Delivery Care in Indonesia.” *Studies in Family Planning* 32(2): 130–46. doi:10.1111/j.1728-4465.2001.00130.x.

Blanton, Robert G., Bryan Early, and Dursun Peksen. 2018. “Out of the Shadows or into the Dark? Economic Openness, IMF Programs, and the Growth of Shadow Economies.” *The Review of International Organizations* 13(2): 309–33. doi:10.1007/s11558-018-9298-3.

Bonnet, Florence, Joann Vanek, and Martha Chen. 2019. *Women and Men in the Informal Economy: A Statistical Brief*. Manchester, UK: WEIGO.

Chant, Sylvia, and Carolyn Pedwell. 2008. *Women, Gender and the Informal Economy: An Assessment of ILO Research and Suggested Ways Forward*. Geneva: International Labour Office.

Chen, Martha Alter. 2023. “The Informal Economy in Comparative Perspective: Theory, Policy and Reality.” *The Indian Journal of Labour Economics* 66(2): 395–420. doi:10.1007/s41027-023-00444-7.

Cingranelli, David, and Mikhail Filippov. 2018. “Are Human Rights Practices Improving?” *American Political Science Review* 112(4): 1083–89. doi:10.1017/S0003055418000254.

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, Kyle M. Marquardt, Juraj Medzihorsky, et al. 2020. “Varieties of Democracy V10.” doi:10.2139/ssrn.3557904.

Deléchat, Corinne, and Leandro Medina. 2021. “What Do We Know About the Informal Economy?” In *The Global Informal Workforce: Priorities for Inclusive Growth*, eds. Corinne Deléchat and Leandro Medina. Washington, DC, USA: International Monetary Fund, 1–9. https://doi.org/10.5089/9781513575919.071.

Devine, Hilary. 2021. “How Institutions Shape the Informal Economy.” In *The Global Informal Workforce: Priorities for Inclusive Growth*, eds. Corrine Deléchat and Leandro Medina. Washington, DC, USA: International Monetary Fund, 220–50. https://doi.org/10.5089/9781513575919.071.

Downs, George W., David M. Rocke, and Peter N. Barsoom. 1996. “Is the Good News about Compliance Good News about Cooperation?” *International Organization* 50(3): 379–406. doi:10.1017/S0020818300033427.

Elgin, Ceyhun, and Adem Yavuz Elveren. 2021. “Informality, Inequality, and Feminization of Labor.” *Women’s Studies International Forum* 88: 102505. doi:10.1016/j.wsif.2021.102505.

Elgin, Ceyhun, and Oguz Oztunali. 2012. “Shadow Economies Around the World: Model Based Estimates.” *Bogazici University Department of Economics Working Papers* 5: 1–48.

Englehart, Neil A., and Melissa K. Miller. 2014. “The CEDAW Effect: International Law’s Impact on Women’s Rights.” *Journal of Human Rights* 13(1): 22–47. doi:10.1080/14754835.2013.824274.

Farhan, Fiza, Begona Lasagabaster, Teresa Marchiori, Siriel Mchembe, Alivelu Ramisetty, Fernanda Vidal, and Marlese Von Broembsen. 2016. *Ensuring Legal Protections and Reforming Discriminatory Laws and Regulations*. New York, NY: UN Women. https://www.unwomen.org/sites/default/files/2023-01/hlp-wee-toolkit-driver-2-en.pdf.

Fariss, Christopher J. 2014. “Respect for Human Rights Has Improved Over Time: Modeling the Changing Standard of Accountability.” *American Political Science Review* 108(2): 297–318. doi:10.1017/S0003055414000070.

Fariss, Christopher J. 2019. “Yes, Human Rights Practices Are Improving Over Time.” *American Political Science Review* 113(3): 868–81. doi:10.1017/S000305541900025X.

Frederick, Anne, Lily Kennedy, Andrew Friedman, and Michelle Strucke. 2025. “What Are the U.S. Department of State Human Rights Reports?” *Center for Strategic & International Studies (CSIS)*. https://www.csis.org/analysis/what-are-us-department-state-human-rights-reports.

Georgieva, Kristalina. 2021. “Foreword.” In *The Global Informal Workforce: Priorities for Inclusive Growth*, eds. Corinne C. Deléchat and Leandro Medina. Washington, DC, USA: International Monetary Fund, v–vi. https://doi.org/10.5089/9781513575919.071.

Gërxhani, Klarita. 2004. “The Informal Sector in Developed and Less Developed Countries: A Literature Survey.” *Public Choice* 120(3/4): 267–300. doi:10.1023/B:PUCH.0000044287.88147.5e.

Gevrek, Deniz, and Karen Middleton. 2016. “Globalization and Women’s and Girls’ Health in 192 UN-Member Countries: Convention on the Elimination of All Forms of Discrimination against Women.” *International Journal of Social Economics* 43(7): 692–721. doi:10.1108/IJSE-07-2014-0139.

Ghosh, Jayati. 2013. *Economic Crises and Women’s Work: Exploring Progressive Strategies in a Rapidly Changing Global Environment*. New York: UN Women.

Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg, and Håvard Strand. 2002. “Armed Conflict 1946-2001: A New Dataset.” *Journal of Peace Research* 39(5): 615–37. doi:10.1177/0022343302039005007.

Goodman-Bacon, Andrew. 2021. “Difference-in-Differences with Variation in Treatment Timing.” *Journal of Econometrics* 225(2): 254–77. doi:10.1016/j.jeconom.2021.03.014.

Gurtoo, Anjula, and Colin C. Williams. 2009. “Entrepreneurship and the Informal Sector: Some Lessons from India.” *The International Journal of Entrepreneurship and Innovation* 10(1): 55–62. doi:10.5367/000000009787414280.

Hafner-Burton, Emilie M., and Kiyoteru Tsutsui. 2007. “Justice Lost! The Failure of International Human Rights Law To Matter Where Needed Most.” *Journal of Peace Research* 44(4): 407–25. doi:10.1177/0022343307078942.

Hafner-Burton, Emilie M., and Kiyoteru Tsutsui. 2005. “Human Rights in a Globalizing World: The Paradox of Empty Promises.” *American Journal of Sociology* 110(5): 1373–1411. doi:10.1086/428442.

Hallward-Driemeier, Mary, and Ousman Gajigo. 2015. “Strengthening Economic Rights and Women’s Occupational Choice: The Impact of Reforming Ethiopia’s Family Law.” *World Development* 70: 260–73. doi:10.1016/j.worlddev.2015.01.008.

Hathaway, Oona A. 2002. “Do Human Rights Treaties Make a Difference?” *Yale Law Journal* 111(8): 1935–2042.

Heintz, James, Shahra Razavi, Papa Seck, Slike Staab, and Laura Turquet. 2015. *Progress of the World’s Women 2015–2016: Transforming Economies, Realizing Rights*. New York, NY: UN Women. https://www.unwomen.org/en/digital-library/publications/2015/4/progress-of-the-worlds-women-2015.

Hill, Daniel W. 2010. “Estimating the Effects of Human Rights Treaties on State Behavior.” *The Journal of Politics* 72(4): 1161–74. doi:10.1017/S0022381610000599.

Hill, Daniel W, and K Anne Watson. 2019. “Democracy and Compliance with Human Rights Treaties: The Conditional Effectiveness of the Convention for the Elimination of All Forms of Discrimination against Women.” *International Studies Quarterly* 63(1): 127–38. doi:10.1093/isq/sqy058.

Hoffman, Steven J., Prativa Baral, Susan Rogers Van Katwyk, Lathika Sritharan, Matthew Hughsam, Harkanwal Randhawa, Gigi Lin, et al. 2022. “International Treaties Have Mostly Failed to Produce Their Intended Effects.” *Proceedings of the National Academy of Sciences* 119(32). doi:10.1073/pnas.2122854119.

Hyland, Marie, Simeon Djankov, and Pinelopi Koujianou Goldberg. 2020. “Gendered Laws and Women in the Workforce.” *American Economic Review: Insights* 2(4): 475–90. doi:10.1257/aeri.20190542.

Imai, Kosuke, In Song Kim, and Erik H. Wang. 2021. “Matching Methods for Causal Inference with Time-Series Cross-Sectional Data.” *American Journal of Political Science* 67(3): 587–605. doi:10.1111/ajps.12685.

Iversen, Torben, and Frances Rosenbluth. 2006. "The Political Economy of Gender: Explaining Cross-National Variation in the Gender Division of Labor and the Gender Voting Gap." *American Journal of Political Science* 50(1): 1–19. doi:10.1111/j.1540-5907.2006.00166.x.

La Porta, Rafael, and Andrei Shleifer. 2008. "The Unofficial Economy and Economic Development." *Brookings Papers on Economic Activity* 2008(2): 275–363. doi:10.1353/eca.0.0016.

La Porta, Rafael, and Andrei Shleifer. 2014. "Informality and Development." *Journal of Economic Perspectives* 28(3): 109–26. doi:10.1257/jep.28.3.109.

Lagarde, Christine. 2014. *The Economic Power of Women's Empowerment*. Washington, DC: International Monetary Fund. https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp091214.

Lindberg, Staffan I., Nils Düpont, Masaaki Higashijima, Yaman Berker Kavasoglu, Kyle L. Marquardt, Michael Bernhard, Holger Döring, et al. 2022. "V-Party Dataset V2." doi:https://doi.org/10.23696/vpartydsv2.

Malta, Vivian, Lisa Kolovich, Angelica Martinez Levya, and Marina M. Tavares. 2021. "The Close Relationship between Informality and Gender Gaps in Sub-Saharan Africa." In *The Global Informal Workforce: Priorities for Inclusive Growth*, eds. Corinne C. Deléchat and Leandro Medina. Washington, DC, USA: International Monetary Fund, 188–217. https://doi.org/10.5089/9781513575919.071.

Marshall, Monty G., and Ted Robert Gurr. 2022. "Polity5: Political Regime Characteristics and Transitions, 1800-2018." https://www.systemicpeace.org/inscrdata.html.

Özgür, Gökçer, Ceyhun Elgin, and Adem Y. Elveren. 2021. "Is Informality a Barrier to Sustainable Development?" *Sustainable Development* 29(1): 45–65. doi:10.1002/sd.2130.

Pandey, Kabita. 2013. "Judicial Education on the Convention on Elimination of Discrimination against Women in Nepal." In *Women's Human Rights: CEDAW in International, Regional, and National Law*, Studies on Human Rights Conventions, eds. Anne Hellum and Henriette Sinding Aasen. Cambridge, United Kingdom: Cambridge University Press, 410–29.

Perry, Guillermo E., Omar Arias, Pablo Fajnzylber, William F. Maloney, Andrew Mason, and Jaime Saavedra-Chanduvi. 2007. *Informality: Exit and Exclusion*. The World Bank. doi:10.1596/978-0-8213-7092-6.

Richards, David, and Ronald Gelleny. 2007. "Women's Status and Economic Globalization." *International Studies Quarterly* 51(4): 855–76. doi:10.1111/j.1468-2478.2007.00480.x.

Ross, Michael L. 2008. "Oil, Islam, and Women." *American Political Science Review* 102(1): 107–23. doi:10.1017/S0003055408080040.

Schneider, Friedrich, Andreas Buehn, and Claudio E. Montenegro. 2010. "New Estimates for the Shadow Economies All over the World." *International Economic Journal* 24(4): 443–61. doi:10.1080/10168737.2010.525974.

Schneider, Friedrich, and Dominik H Enste. 2000. "Shadow Economies: Size, Causes, and Consequences." *Journal of Economic Literature* 38(1): 77–114. doi:10.1257/jel.38.1.77.

Schneider, Friedrich, and Colin C. Williams. 2013. *The Shadow Economy*. London: IEA, Inst. of Economic Affairs.

Simmons, Beth A. 2000. "International Law and State Behavior: Commitment and Compliance in International Monetary Affairs." *American Political Science Review* 94(4): 819–35. doi:10.2307/2586210.

Simmons, Beth A., and Daniel J. Hopkins. 2005. "The Constraining Power of International Treaties: Theory and Methods." *American Political Science Review* 99(4): 623–31. doi:10.1017/S0003055405051920.

Smith-Cannoy, Heather, Wendy H. Wong, Arjumand Siddiqi, Christopher Tait, and Abtin Parnia. 2020. "When Everyone Agrees: Human Rights Norms on Women and Children and Their Effects on Health." *The International Journal of Human Rights* 24(10): 1537–71. doi:10.1080/13642987.2020.1743975.

Tait, Christopher A., Ifrah Abdillahi, Wendy Wong, Heather Smith-Cannoy, and Arjumand Siddiqi. 2019. "Can the Health Effects of Widely-Held Societal Norms Be Evaluated? An Analysis of the United Nations Convention on the Elimination of All Forms of Discrimination against Women (UN-CEDAW)." *BMC Public Health* 19(1): 279. doi:10.1186/s12889-019-6607-6.

Teobaldelli, Désirée, and Friedrich Schneider. 2013. "The Influence of Direct Democracy on the Shadow Economy." *Public Choice* 157(3–4): 543–67. doi:10.1007/s11127-013-0098-2.

Thornton, Arland, Duane F. Alwin, and Donald Camburn. 1983. "Causes and Consequences of Sex-Role Attitudes and Attitude Change." *American Sociological Review* 48(2): 211. doi:10.2307/2095106.

Tokman, Víctor E. 2007a. "Informality: Exclusion and Precariousness." Paper prepared for the *Tripartite Interregional Symposium on the Informal Economy: Enabling Transition to Formalization*, organized by the International Labor Office, Geneva, November 27–29.

Tokman, Víctor E. 2007b. "The Informal Economy, Insecurity and Social Cohesion in Latin America." *International Labour Review* 146(1–2): 81–107. doi:10.1111/j.1564-913X.2007.00006.x.

United Nations. n.d. *Convention on the Elimination of All Forms of Discrimination Against Women: Country Reports*. https://www.un.org/womenwatch/daw/cedaw/reports.htm.

United Nations General Assembly. 1979. *Convention on the Elimination of All Forms of Discrimination against Women*. The United Nations.

Verveer, Melanne, and Rangita de Silva de Alwis. 2021. "Why Ratifying the Convention on the Elimination of Discrimination against Women (CEDAW) Is Good for America's Domestic Policy." *Georgetown Institute for Women, Peace and Security*. https://giwps.georgetown.edu/why-ratifying-the-convention-on-the-elimination-of-discrimination-against-women-cedaw-is-good-for-americas-domestic-policy/.

Von Stein, Jana. 2005. "Do Treaties Constrain or Screen? Selection Bias and Treaty Compliance." *American Political Science Review* 99(4): 611–22. doi:10.1017/S0003055405051919.

Von Stein, Jana. "UN Human Rights Agreements - Data by Agreement." https://politicsir.cass.anu.edu.au/research/projects/human-rights/un-human-rights-agreements.

Vreeland, James Raymond. 2008. "Political Institutions and Human Rights: Why Dictatorships Enter into the United Nations Convention Against Torture." *International Organization* 62(01). doi:10.1017/S002081830808003X.

Weichselbaumer, Doris, and Rudolf Winter-Ebmer. 2007. "The Effects of Competition and Equal Treatment Laws on Gender Wage Differentials." *Economic Policy* 22(50): 236–87. doi:10.1111/j.1468-0327.2007.00177.x.

Williams, Colin C. 2017. "Tackling Employment in the Informal Economy: A Critical Evaluation of the Neoliberal Policy Approach." *Economic and Industrial Democracy* 38(1): 145–69. doi:10.1177/0143831X14557961.

Williams, Colin C, Ioana A Horodnic, and Jan Windebank. 2015. "Explaining Participation in the Informal Economy: An Institutional Incongruence Perspective." *International Sociology* 30(3): 294–313. doi:10.1177/0268580915578745.

Wooldridge, Jeff. 2007. "What's New in Econometrics? Lecture 10 Difference-in-Differences Estimation." *NBER Summer Institute 2007* 9(2011): 85.

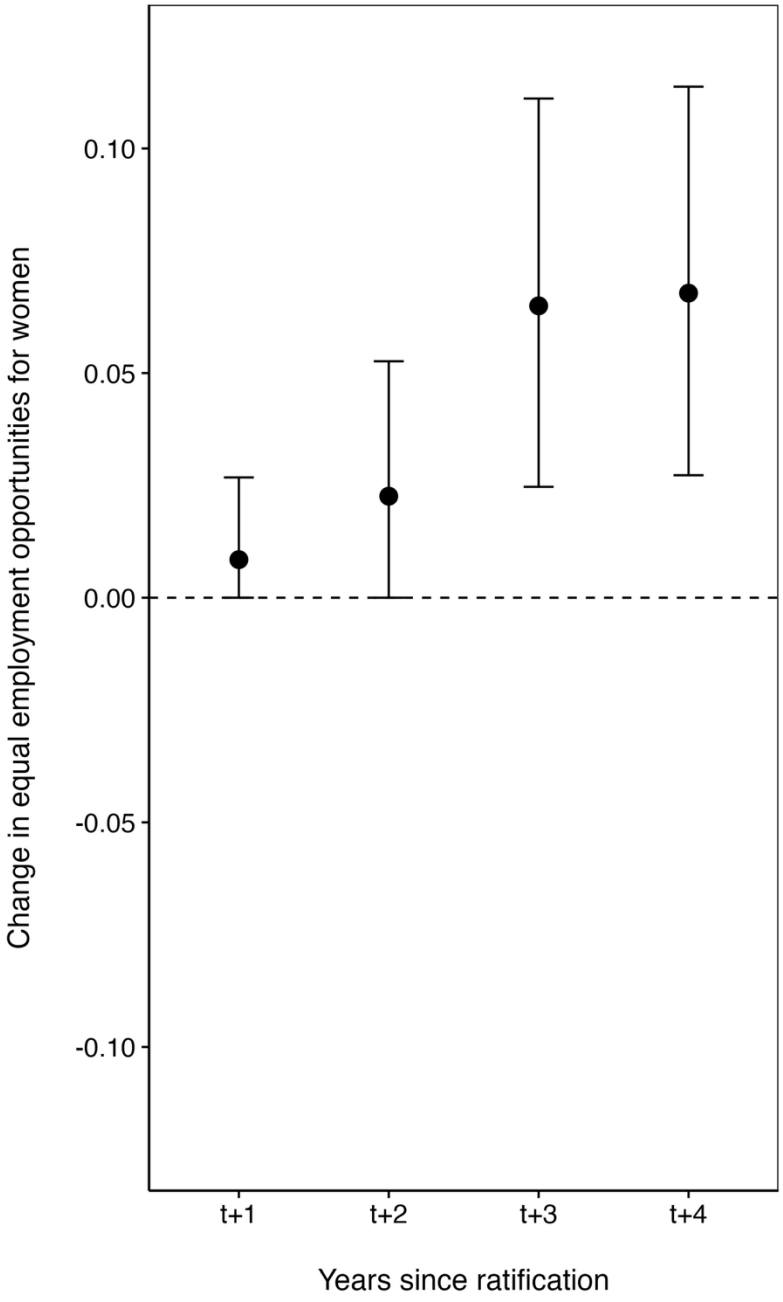
Working Women's Network. "Welcome to Working Women's Network." http://wwn-net.org/english/wwnにようこそ.

World Bank. 2022a. "Female Labor Force Participation." *Gender Data Portal*. https://genderdata.worldbank.org/data-stories/flfp-data-story/.

World Bank. 2022b. *Women, Business and the Law 2022*. Washington, D.C.: World Bank Gender Statistics. https://databank.worldbank.org/source/gender-statistics.

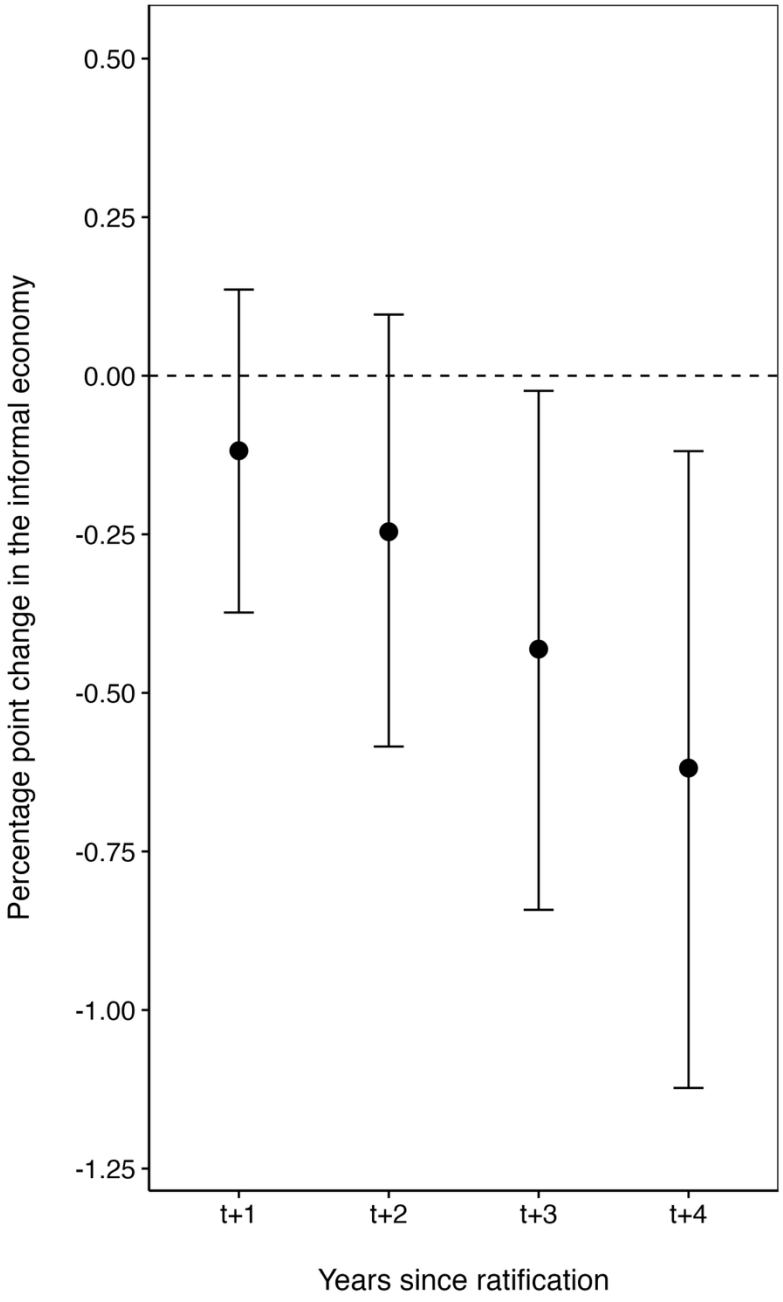
World Bank. 2022c. "World Development Indicators." https://databank.worldbank.org/source/world-development-indicators.

Figure 1 Estimated Effect of CEDAW Ratification on Equal Employment Opportunities for Women



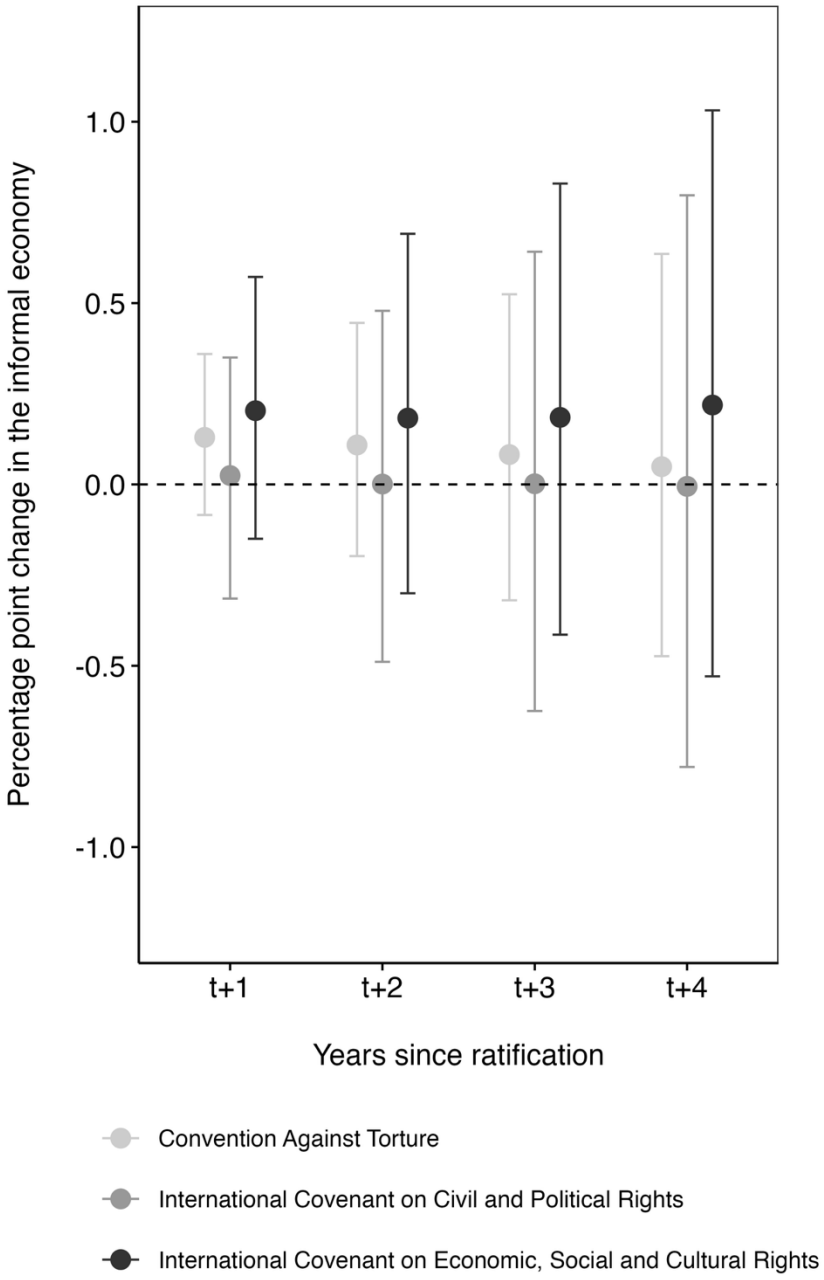
Note: The y-axis shows the percentage point change in women able to seek employment on an equal basis with men, while the x-axis shows the time (in years) after a country ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

Figure 2 Estimated Effect of CEDAW Ratification on the Size of the Informal Economy



Note: The y-axis shows the percentage point change ratification of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) has on the size of the informal economy while the x-axis shows the time (in years) after a country ratified CEDAW. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

Figure 3 Ratification of Alternative Human Rights Treaties on the Size of the Informal Economy



Note: The y-axis shows the percentage point change in the size of the informal economy per treaty. The x-axis shows the time (in years) after a ratification. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

Supplemental Information for Breaking Barriers: How an International Treaty for Women Reduces the Size of the Informal Economy

This supplemental information is intended for online publication only.

Table of Contents

A. Descriptive Statistics

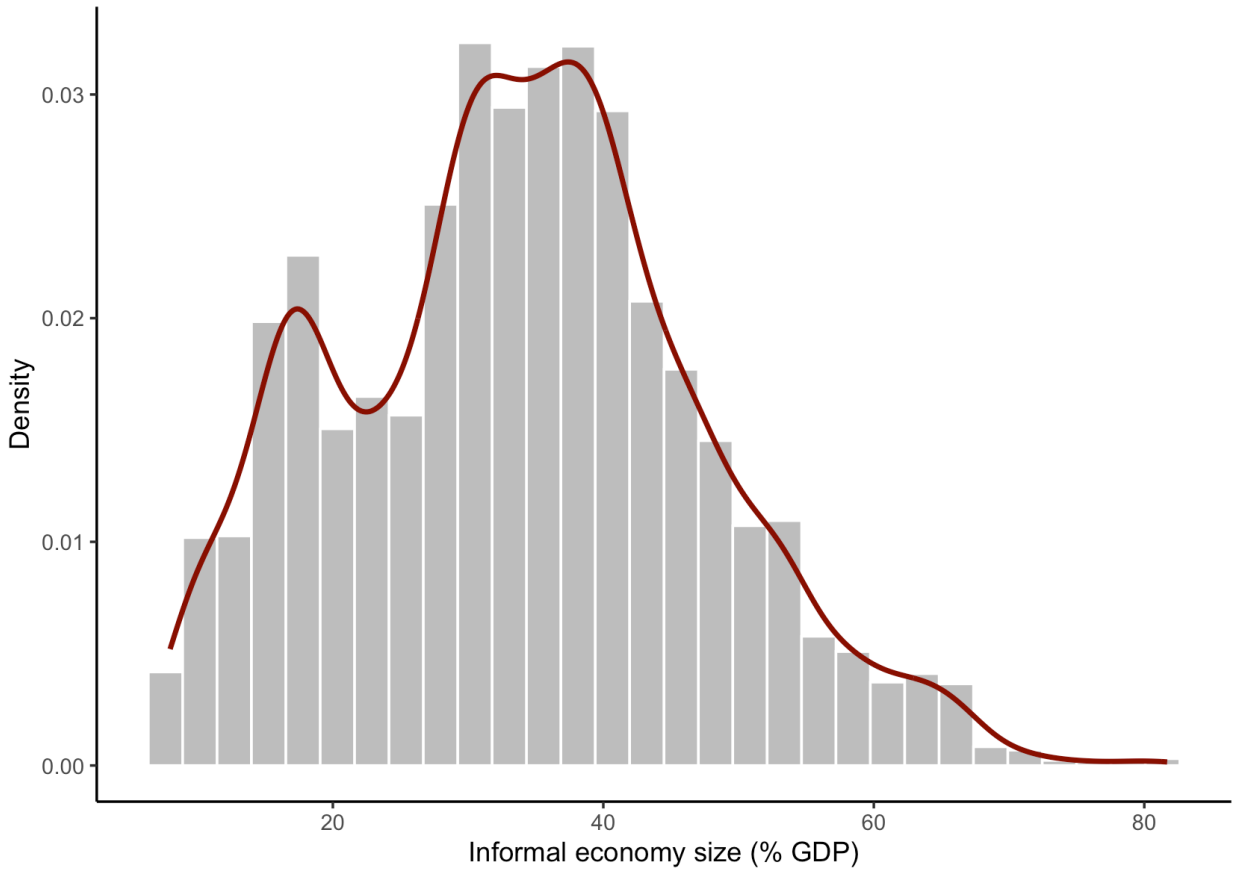
A.1 Summary Statistics

Below are summary statistics for the variables used in the main analyses.

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
Informal economy size (% GDP)	5174	34	13	8	24	42	82
Equal work for women	5171	0.78	0.42	0	1	1	1
Treatment indicator	5202	0.77	0.42	0	1	1	1
Conflict intensity	5202	0.21	0.5	0	0	0	2
Inflation (annual %)	4551	34	445	-18	2.5	11	23773
Unemployment (%, ILO)	3641	8	6.4	0.15	3.7	10	39
FDI (net inflows, % GDP)	4948	3.2	9.4	-58	0.4	3.7	280
Trade (log, % GDP)	4738	4.2	0.55	1.8	3.8	4.5	6.1
CEDAW ratification year	5161	1988	6.6	1980	1982	1993	2009
Credit access	5171	0.83	0.37	0	1	1	1
Gender inclusion	5202	0.59	0.26	0.026	0.38	0.83	0.98
GDP per capita (log)	5006	7.8	1.6	4.6	6.5	9	12
Polity 2	5146	2.5	7	-10	-5	9	10
Oil rents (% GDP)	4945	3.7	9.2	0	0	1.4	79
Women’s civil liberties	5202	0.66	0.25	0	0.5	0.86	0.98
Manufactures exports (% merch exports)	3850	0.43	0.31	0	0.13	0.72	3.7
Official development assistance per capita (log)	3859	3.3	1.2	-3.9	2.6	4.1	6.6
Female labor force participation	3641	55	17	5.4	46	67	91
Corruption indicator	5177	0.51	0.3	0.005	0.21	0.79	0.97
Rule of law indicator	5202	0.54	0.31	0.019	0.26	0.85	1
Civil society organizations	5202	0.63	0.29	0.013	0.38	0.89	0.98
Women, business and the law (composite index)	5202	61	18	18	48	74	100

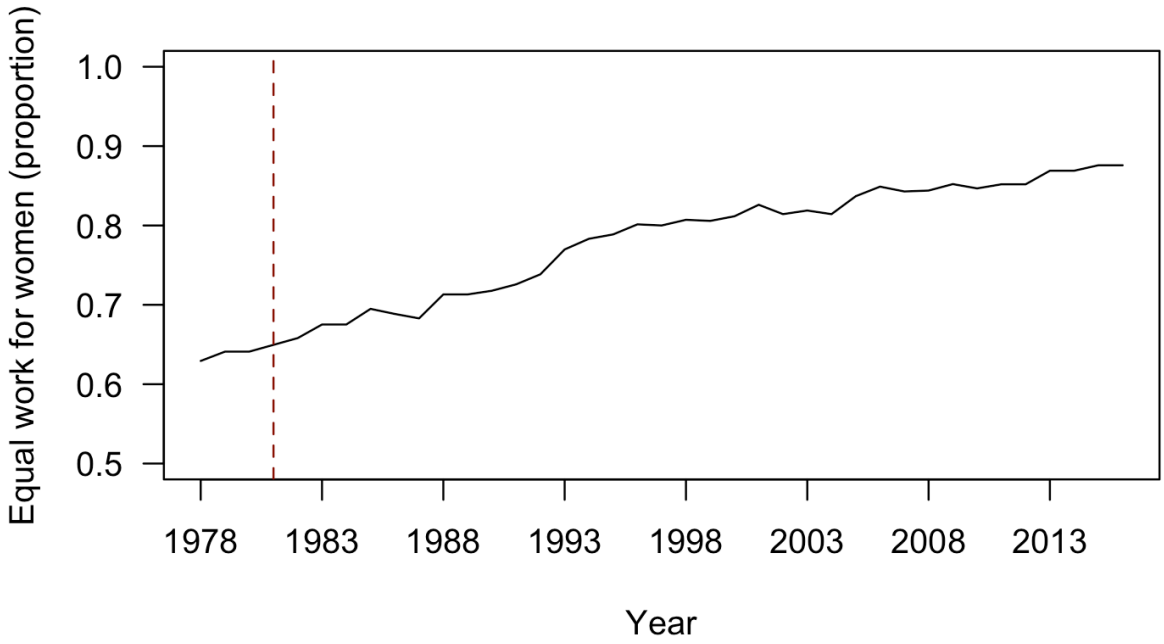
A.2 Distribution of Informal Economic Activity in the Sample

The below figure shows the distribution of informal economic activity in the sample.



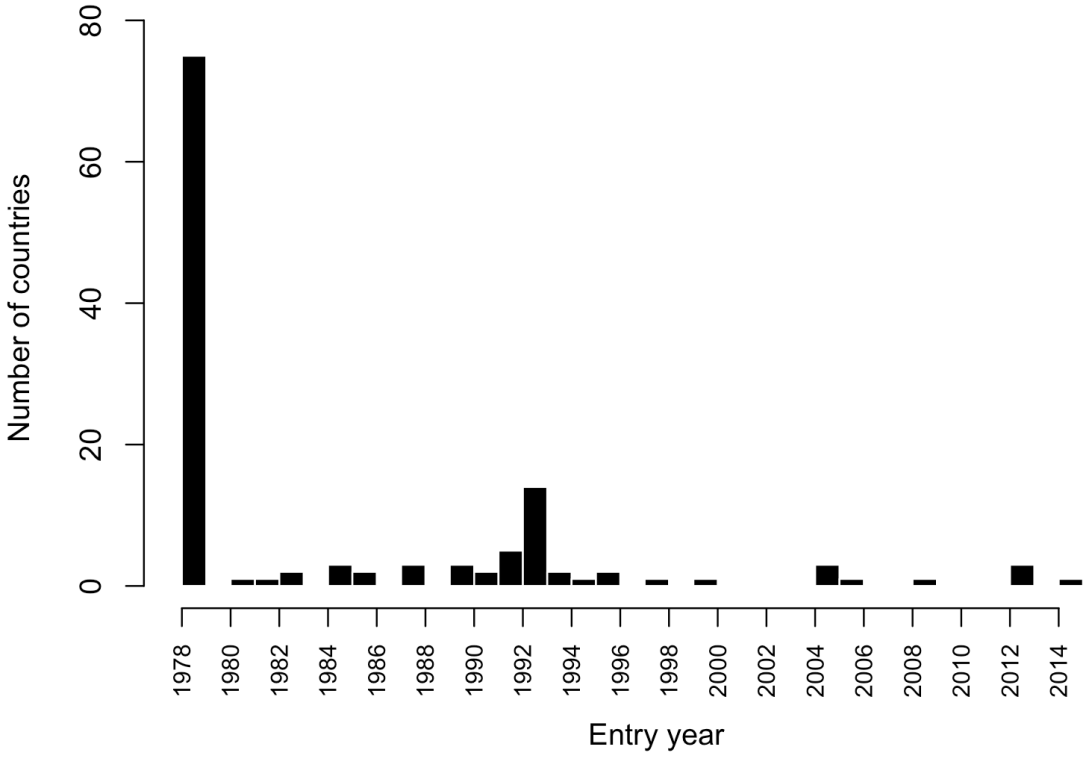
A.3 Distribution of Equality of Economic Opportunity for Women Over Time

In the below figure, the y-axis shows the proportion of countries in the sample that have passed laws ensuring equality of economic opportunity for women over time. The x-axis shows the years covered in the sample, spanning from 1978 – 2016, while the dashed red line shows the year CEDAW came into force (1981).



A.4 Variation in New Laws Passed Ensuring Equal Work For Women

The below figure shows variation over time when new laws were passed ensuring women equality of economic opportunity. The y-axis shows the number of countries where laws have been passed, while the x-axis shows the years.



B. Covariate Balance and Parallel Trends

B.1 Balance for Women's Equal Employment Opportunities

The below tables shows balance for the outcome variable and covariates between treated and control units up to three years prior to treatment. The first section of the table shows balance using equal weights between treated and control groups (i.e., no refinement), while the following sections of the table shows balance between groups after using the respective matching and weighting algorithms. Lower values are better.

No Refinement

Time	Equal work for women	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.242	0.965	0.235	0.116	0.097	-0.202	0.156	0.270	-0.029	0.201	0.175	-0.116	0.285	0.196	0.509	-0.217
t-2	0.224	0.923	0.153	0.132	0.170	-0.120	0.022	0.331	0.048	0.152	0.170	-0.077	0.249	0.090	0.461	-0.222
t-1	0.230	0.809	0.126	0.190	0.191	-0.160	-0.027	0.369	0.010	0.157	0.175	-0.015	0.244	0.079	0.514	-0.231
t-0	0.216	0.809	0.131	0.230	0.199	0.026	-0.789	0.277	0.004	0.144	0.169	-0.008	0.290	0.087	0.561	-0.311

Mahalanobis Distance Matching

Time	Equal work for women	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.149	-0.036	0.003	-0.008	0.000	-0.149	0.242	0.056	0.092	0.078	0.057	-0.063	-0.229	0.047	0.288	0.125
t-2	0.140	0.011	-0.029	0.008	0.065	-0.057	0.149	0.179	0.172	0.045	0.058	-0.027	-0.257	0.007	0.225	0.118
t-1	0.143	0.050	-0.001	0.049	0.089	-0.086	0.085	0.276	0.143	0.067	0.060	0.034	-0.224	0.012	0.237	0.111
t-0	0.143	0.136	0.101	0.084	0.097	0.068	-0.177	0.208	0.087	0.067	0.061	0.046	-0.219	-0.003	0.319	0.073

Propensity Score Matching

Time	Equal work for women	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	-0.044	0.966	0.296	-0.063	-0.055	-0.120	0.234	0.168	0.049	-0.039	-0.037	-0.136	0.599	0.156	0.416	-0.107
t-2	-0.042	0.929	0.204	-0.041	-0.019	-0.094	0.017	0.214	0.089	-0.060	-0.030	-0.115	0.608	0.165	0.384	-0.129
t-1	-0.024	0.888	0.209	0.004	0.027	-0.080	0.034	0.287	0.064	-0.052	-0.011	-0.065	0.552	0.116	0.436	-0.109
t-0	-0.030	0.967	0.225	0.037	0.029	0.082	-1.008	0.195	-0.005	-0.060	-0.015	-0.052	0.552	0.170	0.456	-0.148

CBPS-Weighting

Time	Equal work for women	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.009	1.155	0.400	-0.005	-0.004	-0.011	0.188	0.144	-0.021	0.009	-0.027	-0.029	0.515	0.061	0.425	0.001
t-2	0.008	1.054	0.329	0.012	0.027	0.000	0.036	0.150	-0.013	-0.013	-0.026	-0.013	0.500	0.055	0.384	-0.031
t-1	0.017	0.988	0.306	0.052	0.061	-0.043	0.090	0.238	-0.047	-0.011	0.005	0.027	0.457	0.011	0.453	-0.023
t-0	0.012	1.027	0.303	0.096	0.058	0.103	-0.784	0.164	-0.058	-0.019	-0.003	0.033	0.473	0.055	0.486	-0.063

B.2 Balance for the Informal Economy

The below table shows balance for the outcome variable and covariates between treated and control units up to three years prior to treatment. The first section of the table shows balance using equal weights between treated and control groups (i.e., no refinement), while the following sections of the table shows balance between groups after using the respective matching and weighting algorithms. Lower values are better.

No Refinement

Time	Informal Economy	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.258	0.970	0.231	0.114	0.095	-0.200	0.146	0.270	-0.027	0.210	0.177	-0.117	0.286	0.196	0.508	-0.216
t-2	0.283	0.927	0.149	0.133	0.169	-0.119	0.020	0.331	0.050	0.161	0.172	-0.077	0.248	0.090	0.459	-0.221
t-1	0.278	0.812	0.124	0.194	0.192	-0.159	-0.028	0.369	0.012	0.166	0.177	-0.014	0.244	0.079	0.511	-0.230
t-0	0.275	0.810	0.129	0.235	0.198	0.028	-0.790	0.277	0.005	0.153	0.171	-0.007	0.291	0.087	0.557	-0.310

Mahalanobis Distance Matching

Time	Informal Economy	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.142	-0.079	-0.018	0.031	0.056	-0.141	0.292	0.053	0.092	0.109	0.086	-0.053	-0.248	0.104	0.262	0.099
t-2	0.170	-0.033	-0.049	0.045	0.125	-0.059	0.157	0.156	0.172	0.068	0.085	-0.016	-0.267	0.036	0.219	0.098
t-1	0.176	-0.007	-0.019	0.082	0.144	-0.086	0.095	0.251	0.133	0.082	0.085	0.043	-0.225	0.047	0.224	0.096
t-0	0.171	0.079	0.082	0.117	0.142	0.071	-0.156	0.171	0.098	0.082	0.084	0.050	-0.229	0.015	0.313	0.057

Propensity Score Matching

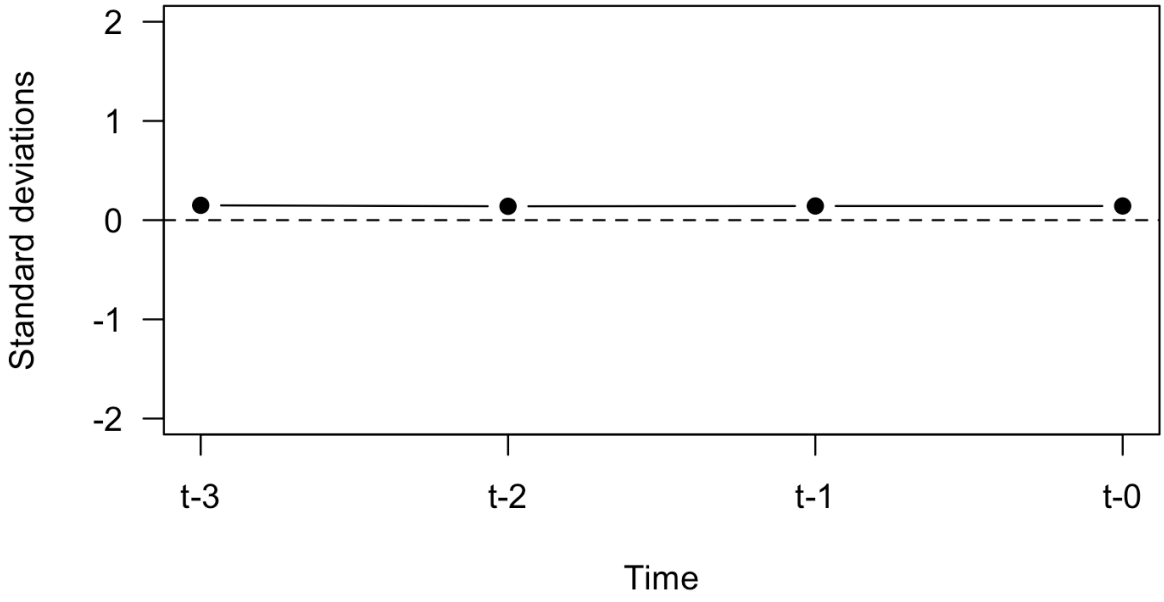
Time	Informal Economy	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.139	1.157	0.263	-0.070	-0.070	-0.078	0.211	0.200	0.054	-0.031	-0.101	-0.150	0.551	0.163	0.428	-0.068
t-2	0.162	1.133	0.212	-0.048	-0.004	0.015	0.095	0.274	0.073	-0.075	-0.100	-0.122	0.551	0.165	0.397	-0.061
t-1	0.154	1.002	0.186	0.015	0.017	-0.065	0.071	0.339	0.020	-0.090	-0.069	-0.071	0.546	0.112	0.437	-0.067
t-0	0.145	0.984	0.173	0.053	0.019	0.070	-0.319	0.241	0.000	-0.097	-0.067	-0.064	0.525	0.147	0.449	-0.111

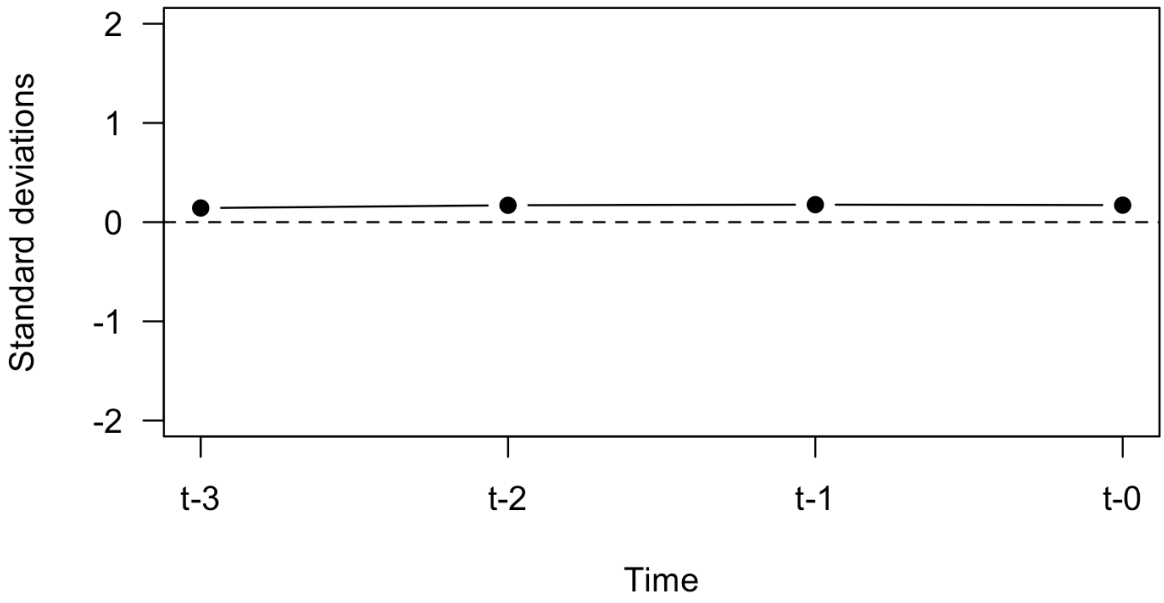
CBPS-Weighting

Time	Informal Economy	Trade(log)	GDPpc(log)	CSO	Polity	FDI	Inflation	Unemployment	Conflict	Credit	Civil liberties	Rule of law	ODApc(log)	Labor Force	Manufactures	Oil rents
t-3	0.043	1.186	0.404	0.002	-0.003	0.003	0.212	0.154	-0.016	0.084	-0.014	-0.032	0.504	0.067	0.431	-0.010
t-2	0.071	1.089	0.328	0.008	0.026	0.010	0.109	0.139	0.006	0.024	-0.020	-0.025	0.480	0.114	0.399	-0.013
t-1	0.074	1.019	0.312	0.059	0.060	-0.027	0.124	0.216	0.011	0.024	0.022	0.008	0.450	0.048	0.462	0.004
t-0	0.066	1.051	0.307	0.103	0.065	0.116	-0.285	0.150	-0.004	0.019	0.014	0.007	0.446	0.080	0.511	-0.043

B.3 Parallel Trends Plots

The top figure below shows the trends between treated and control units prior to treatment onset for Equal Work for Women, while the bottom figure shows the trends for the Informal Economy. The x-axis shows the time (in years) before a country ratifies CEDAW, while the y-axis shows the average difference between treated units and the weighted average of control units across all matched sets and expressed in standard deviations. For both plots, the standardized mean distance is small and relatively constant over time.

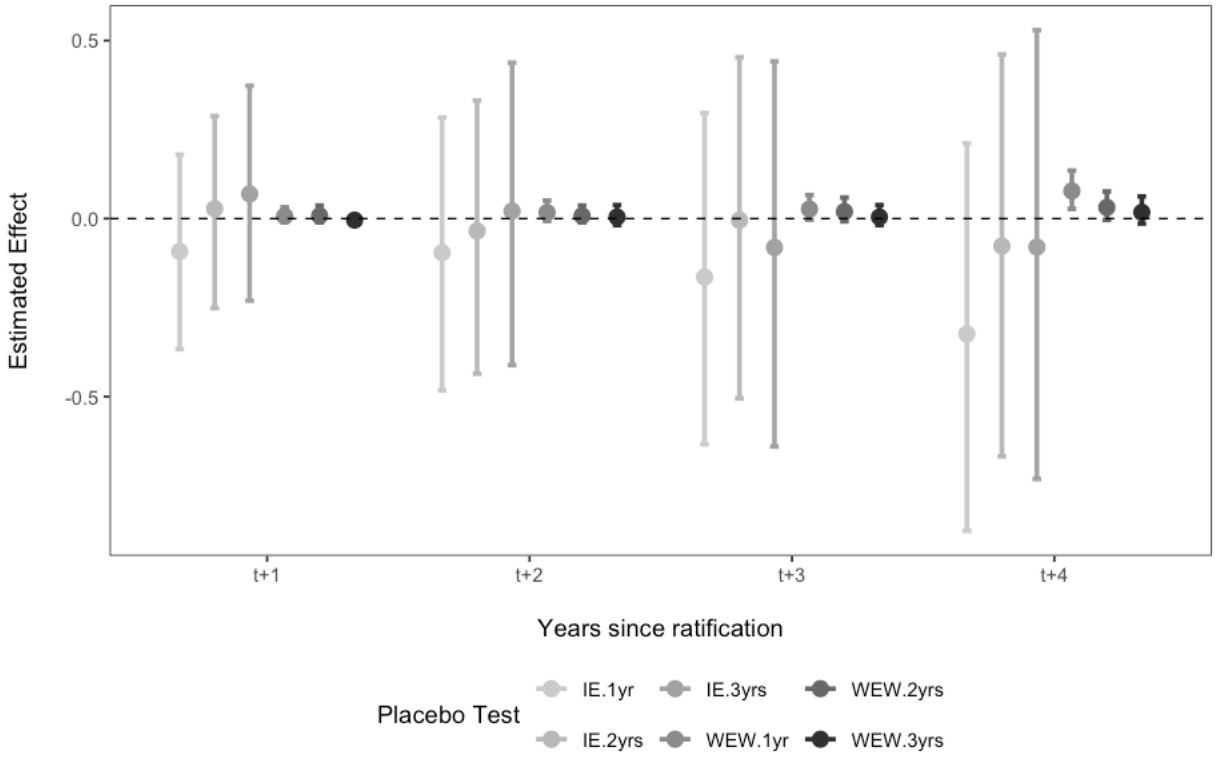




C. Placebo Tests

C.1 Advancing CEDAW Ratification Timing

The below figure shows placebo tests advancing CEDAW's ratification by one, two, or three years for both the informal economy (IE) and equal work for women (WEW).



Note: The y-axis shows the change in the size of the informal economy, or changes in women's equality of economic opportunity, when "advancing" CEDAW's ratification by one, two, or three years. The x-axis shows the time (in years) after this placebo ratification. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations. Due to advancing ratification timing, matches may differ compared to the main analyses.

C.2 `PanelMatch` Placebo Tests

The below table shows the results of a placebo test examining the change in outcome at time t-1, compared to the other pretreatment periods in the lag window. Since the analyses in the manuscript matched treated and control groups using data up to three years prior to treatment, estimates show the change in outcomes at t-3 and t-2 compared to t-1. A null effect indicates there are no significant differences between treated and control groups prior to treatment.

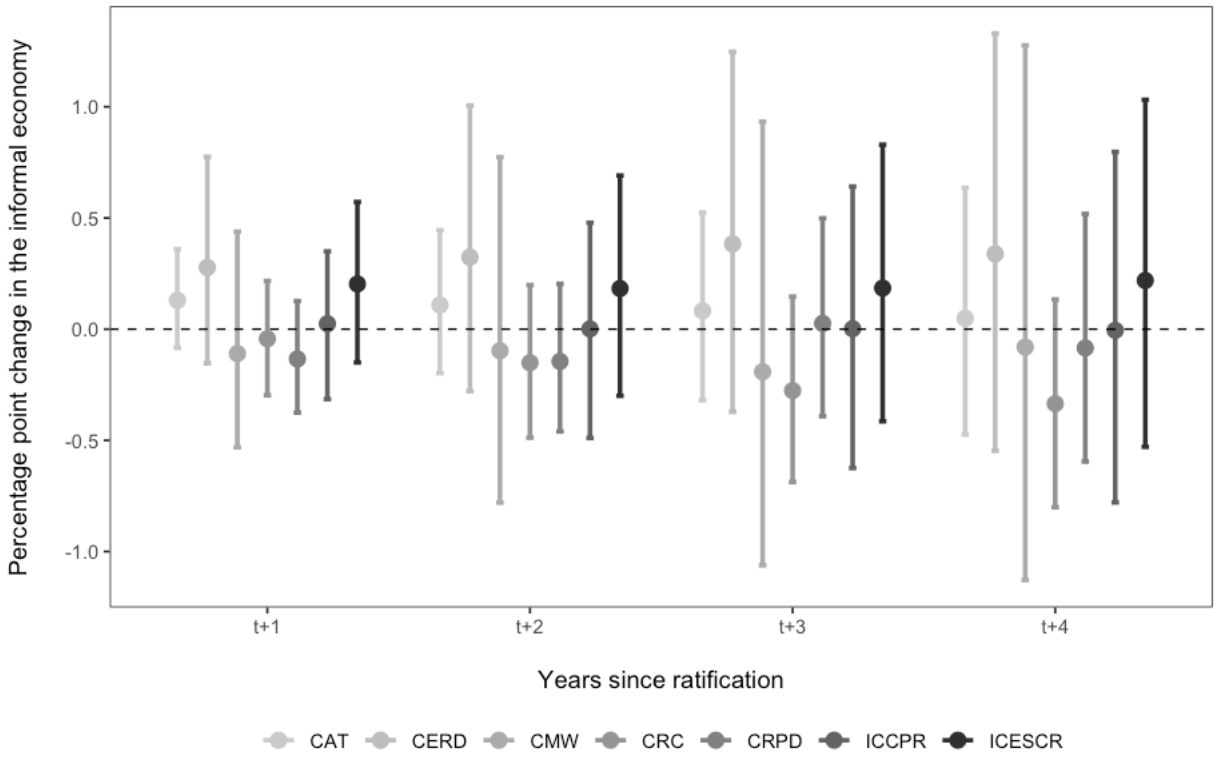
Time	Equal work for women	Informal economy
T-3	0.000 (0.033)	0.651 (1.475)
T-2	0.003 (0.025)	0.228 (1.147)

Note: Standard errors are generated via bootstrapping with 10,000 iterations and shown in parentheses: $^{\dagger}p<0.10$ $^{*}p<0.05$ $^{**}p<0.01$

D. Robustness Checks

D.1 Extended List of Alternative Human Rights Treaties and their Impact on the Informal Economy

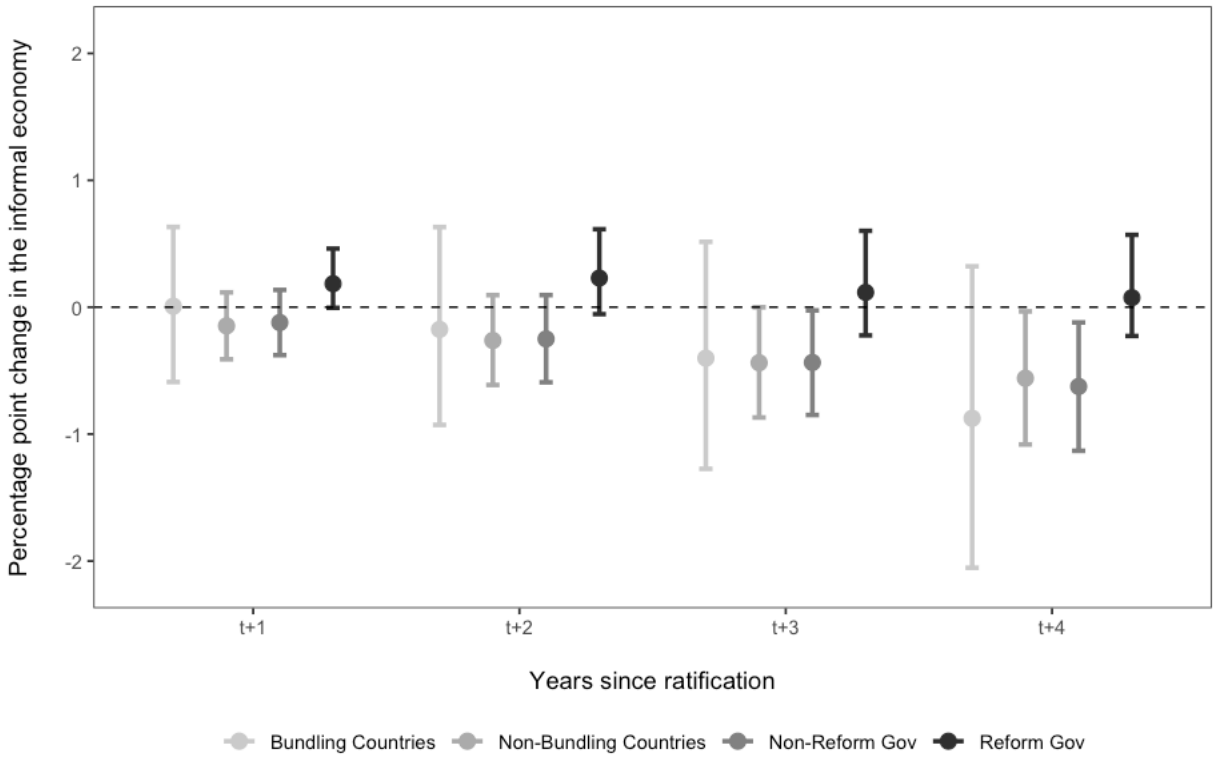
The plot below shows the full list of alternative human rights treaties and their impact on the informal economy including the Convention Against Torture (CAT) Convention on the Elimination of Racial Discrimination (CERD), Convention on the Protection of Migrant Workers (CMW), Convention on the Rights of the Child (CRC), the Convention on the Rights of Persons with Disabilities (CRPD), the International Covenant on Civil and Political Rights (ICCPR), and the International Covenant on Economic, Social and Cultural Rights (ICESCR). These treaties generate ambiguous predictions regarding the reasons behind their null effects, since they are intended to expand rights for vulnerable populations, which is why they were omitted from the manuscript.



Note: The y-axis shows the percentage point change on the size of the informal economy for other prominent human rights treaties. The x-axis shows the time (in years) after a ratification. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

D.2 CEDAW's Impact on the Informal Economy for Reform-Minded Governments and Treaty Bundling Countries

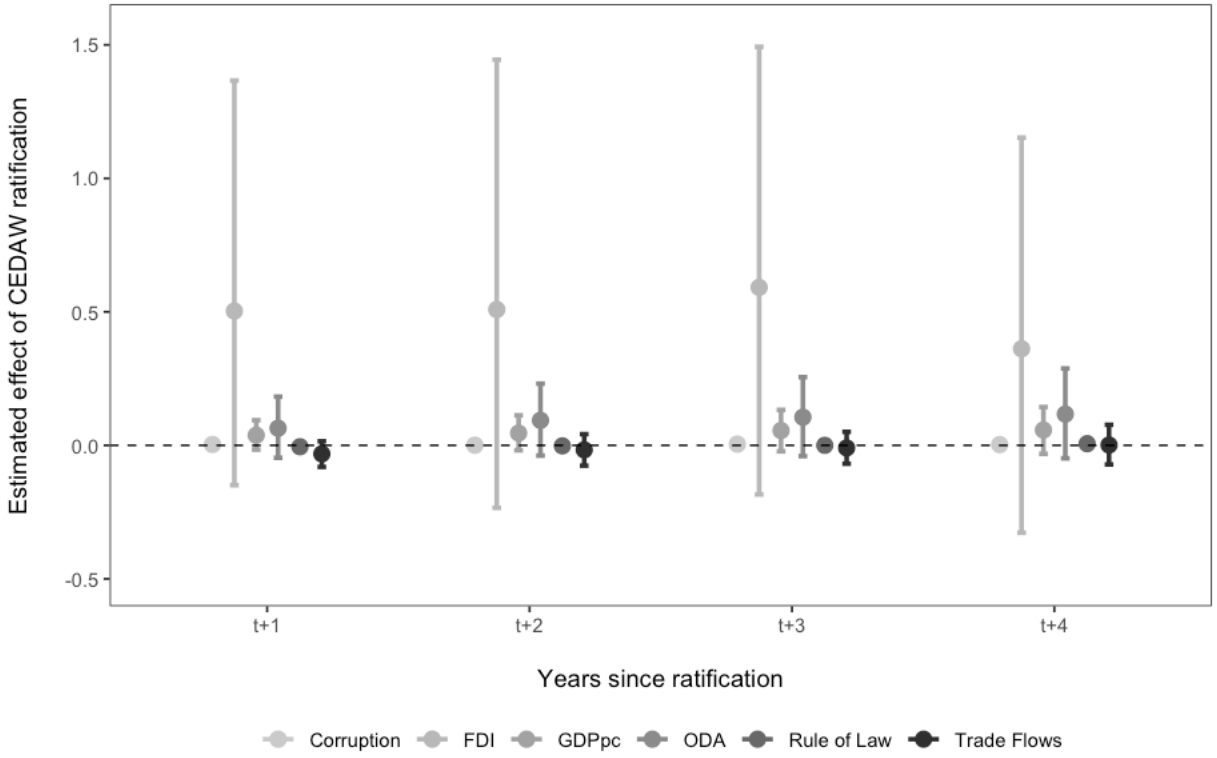
The below plot addresses the alternative story of reform governments driving the results found in the manuscript. To test this, I created a variable from the V-Party dataset that takes a value of 1 if a party moves into power in a given country, thereby becoming Head of Government, *and* strongly supports the equal participation of women in the labor market and 0 otherwise. Additionally, there is also the possibility that countries are bundling multiple human rights treaties while ratifying CEDAW, making it hard to isolating CEDAW's effect on the informal economy. To test both of these alternative explanations, I perform additional matching and DID analyses using a dummy variable for either reform-governments or for those countries bundling multiple treaties at once to see if results are being driven by these subsets of countries. As the figure below shows, neither reform minded governments nor countries who are bundling multiple treaties with CEDAW see a significant reduction in informality.



Note: The y-axis shows the percentage point change on the size of the informal economy for other the different types of governments or countries The x-axis shows the time (in years) after a ratification. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

D.3 The Impact of CEDAW Ratification on Corruption, the Rule of Law, and other Economic Indicators

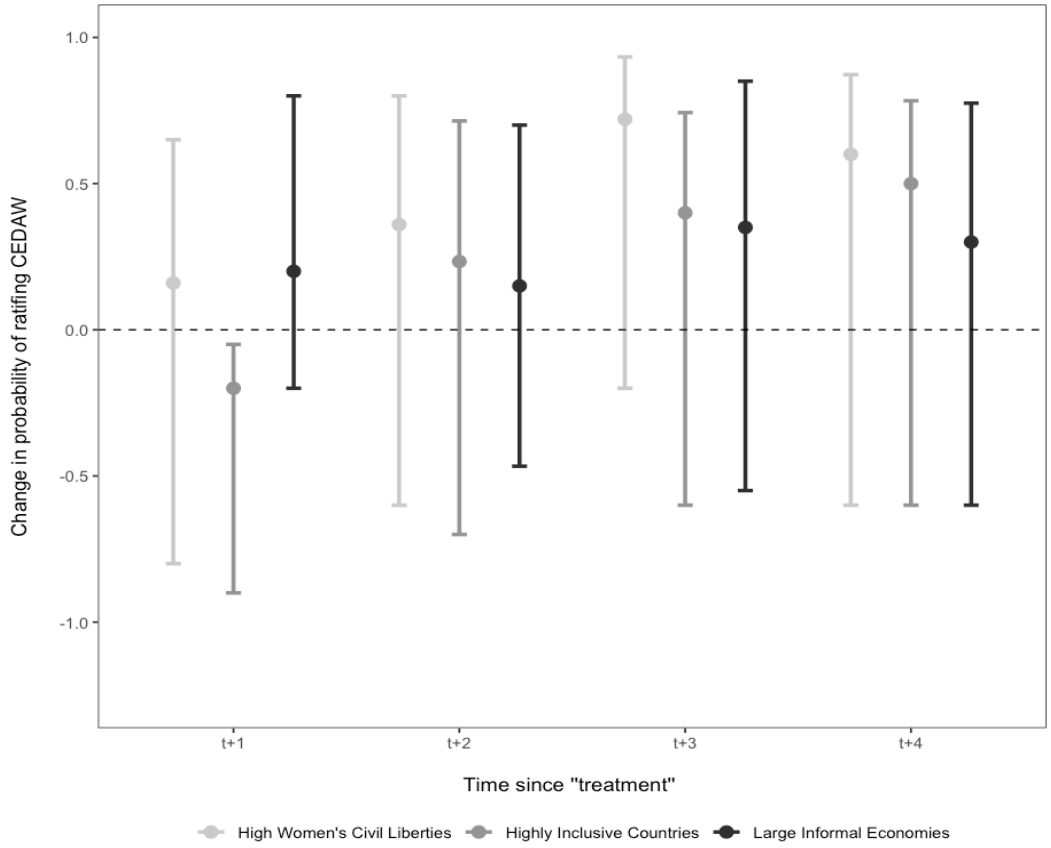
The below plot addresses alternative explanations that ratifying CEDAW i) sends a signal to attract economic investment which could plausibly impact the informal economy; and ii) leads to an increase in the rule of law or a decrease in corruption. Economic variables come from the World Bank's World Development Indicators. The corruption and rule of law indicators come from the Varieties of Democracy (V-Dem) dataset. As can be seen in the figure below, CEDAW ratification does not lead to a significant change in any of the economic outcomes tested, nor does it lead to a significant decrease in corruption or an increase in the rule of law.



Note: The y-axis shows the change in outcome for the following indicators: Corruption, Foreign Direct Investment (FDI), Gross Domestic Product per capita (GDPpc), Official Development Assistant (ODA), the Rule of Law, and Trade flows. The x-axis shows the time (in years) after ratifying the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

D.4 Propensity to Ratify CEDAW due to High Levels of Gender Inclusion, Women's Civil Liberties, or Large Informal Economies

The below figure addresses possible endogeneity concerns surrounding selection into the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) due to high levels of gender inclusion, women's civil liberties, or large informal economies. While both prior levels of informality and women's civil liberties are included in the matching model, concerns around endogeneity merited an additional difference-in-differences analysis. To do this, I created dummy treatments for those countries with pre-ratification values half a standard deviation about the sample mean for gender inclusion, women's civil liberties, or the informal economy. The outcome variable for these analyses is a dummy variable taking a value of one (1) for the year a country ratified CEDAW and every year after that. It is important to note that these result in very small sample sizes, with some as low as 5 treated units. Even so, the plot below shows that these countries are not more likely to ratify CEDAW than other countries in the sample. This should be expected given the near universal ratification status of CEDAW.

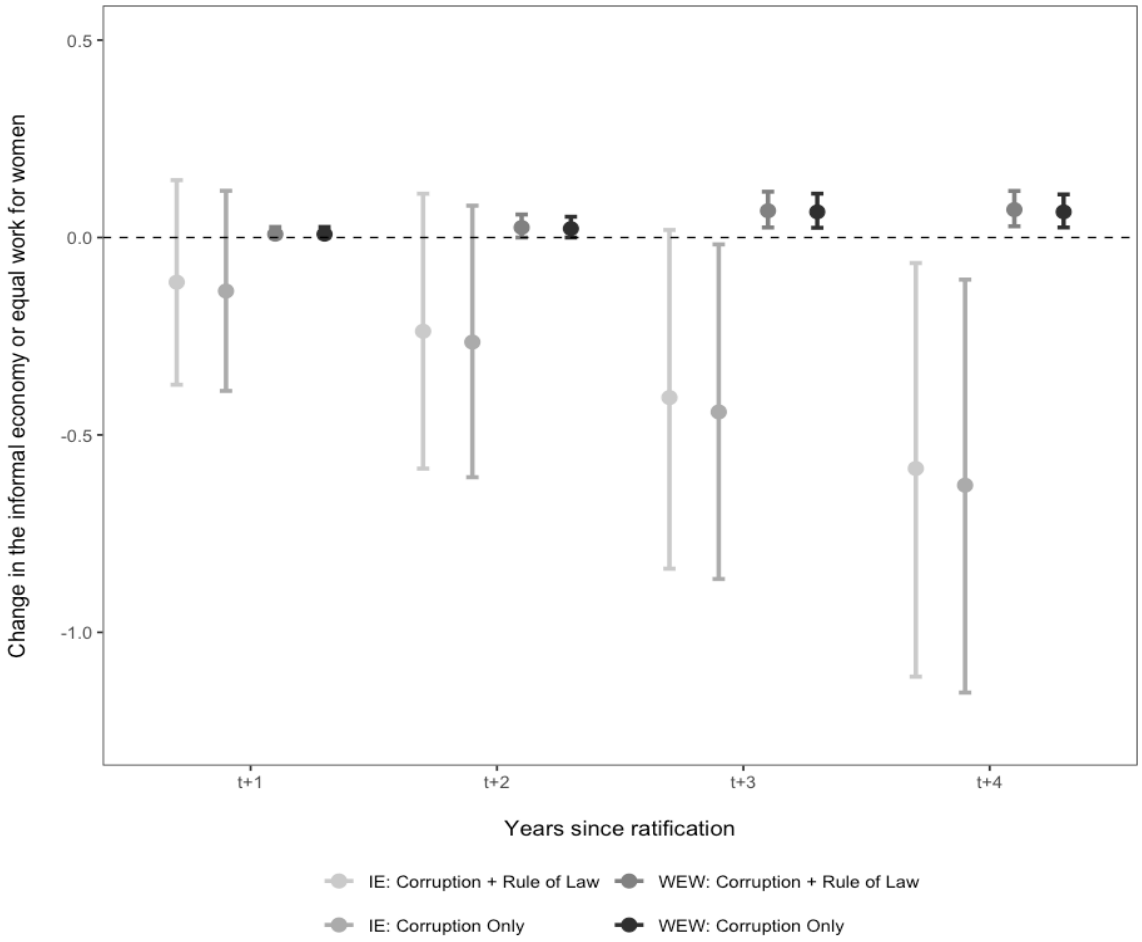


Note: The y-axis shows the change in the probability of ratifying CEDAW. The x-axis shows the time (in years) after a country moves into one of these three categories of countries. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

E. Alternative Matching Specifications

E.1 Adding Corruption into the Matching Models

Corruption was omitted from the main analyses due to concerns regarding multicollinearity with the Rule of Law measure from V-DEM. However, the below plot shoes that results remain essentially unchanged whether or not this variable is added in replacement of, or in addition to, the Rule of Law indicator. Sets of estimate s are labeled depending on which outcome variable is being analyzed. For example, the analysis investigating CEDAW's impact on the informal economy with both Corruption and Rule of Law variables added to the model is designated by "IE Corruption + Rule of Law".



Note: The y-axis shows the change in either the informal economy (IE) or equal work for women (WEW) after ratifying the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). The x-axis shows the time (in years) after ratifying CEDAW. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

E.2 Alternative Matching Methods: Propensity Score Matching & Covariate Balancing Propensity Score Weighting

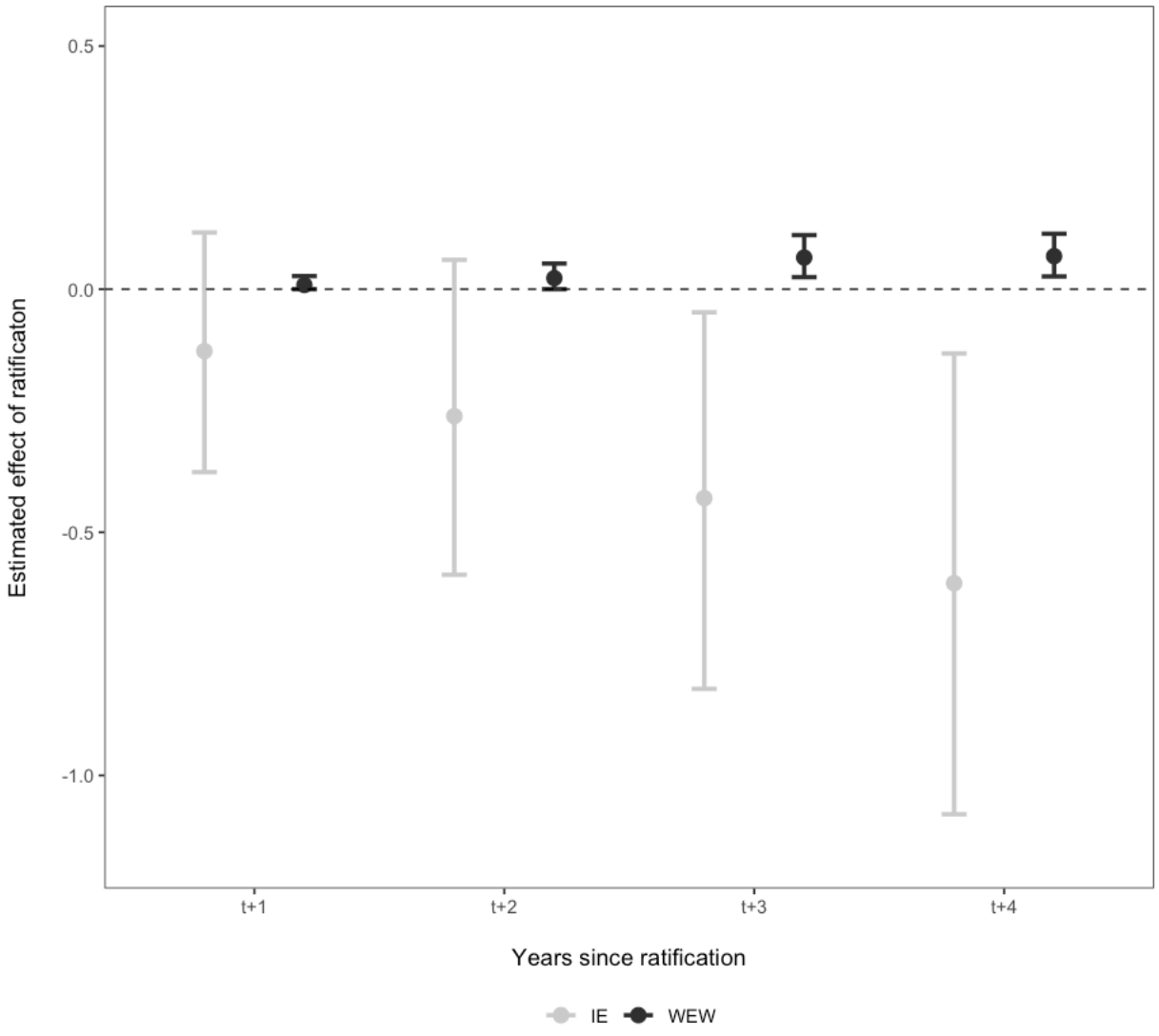
The below table shows the t+3 estimates for Hypotheses 1 and 2 using alternative matching methods – Covariate Balancing Propensity Score Weighting (CBPS) and Propensity Score Matching (PSM). The column titled "Outcome" displays which matching method is used for each analysis. For example, "IE–PSM" relates to an analysis on the informal economy using propensity score matching, while WEW – CBPS relates to an analysis on legal equality of economic opportunity for women using Covariate Balancing Propensity Score Weighting.

Outcome	Estimate	95% Confidence Intervals
Equal work (CBPS)	0.06*	[0.017 , 0.108]
	(0.02)	
Equal work (PSM)	0.05*	[0.005 , 0.103]
	(0.02)	
Informal economy (CBPS)	-0.35*	[-0.689, -0.004]
	(0.18)	
Informal economy (PSM)	-0.52*	[-0.890 , -0.147]
	(0.19)	

Note: Estimates are the difference-in-differences between treated and matched controls units three years after ratification of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Standard errors are generated via bootstrapping with 10,000 iterations: $^{\dagger}p<0.10$ $^{*}p<0.05$ $^{**}p<0.01$

E.3 Adding Gender Inclusion into the Matching Model

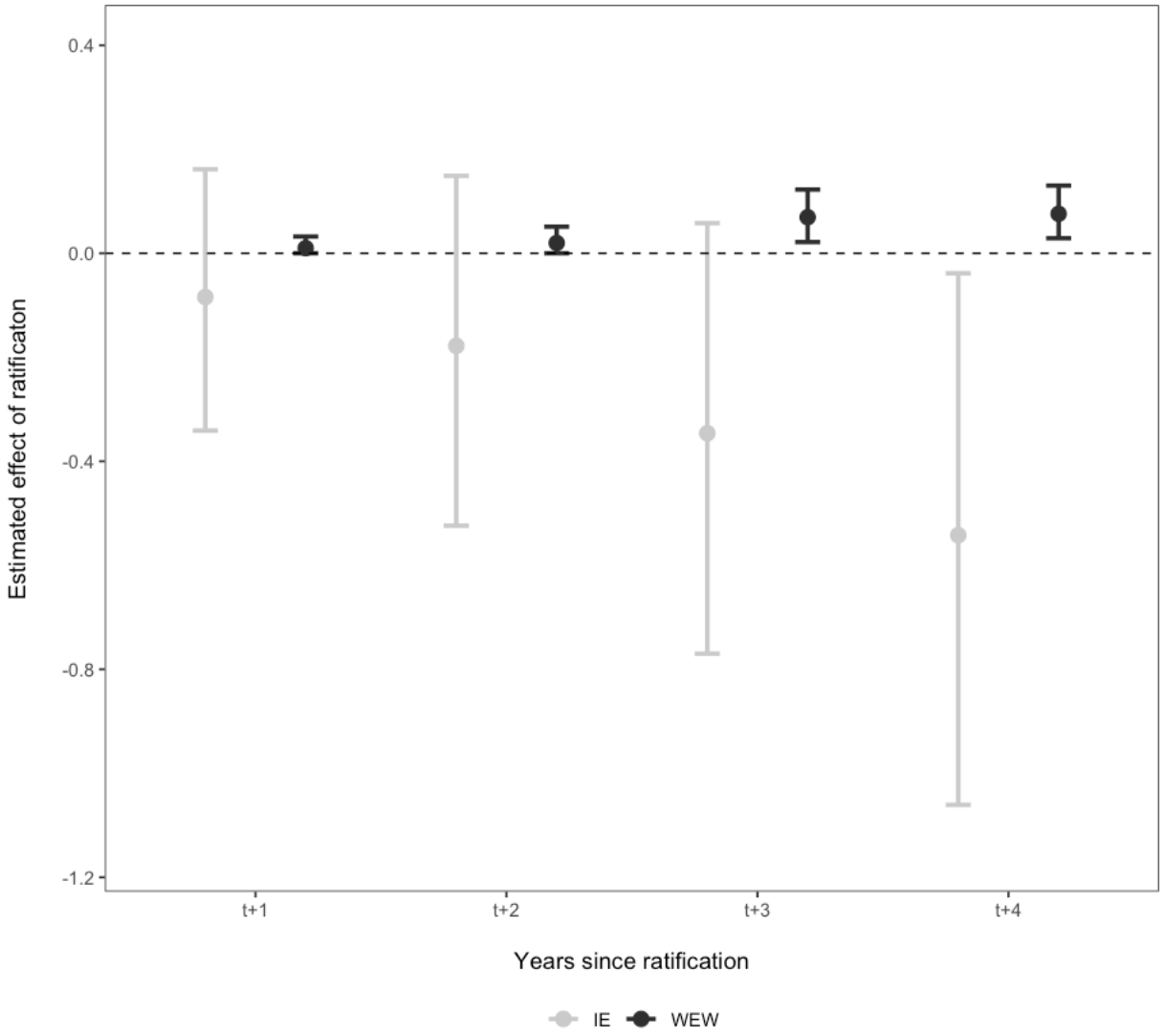
The analyses in the manuscript omitted gender inclusion into the matching model due to concerns around multicollinearity with V-Dem's women civil liberties variable. However, as the plot below shows, results remain unchanged whether this variable is included in the model. The light gray estimates coincide with CEDAW's effect on the informal economy, while the black estimates represent CEDAW's effect on equality in employment opportunity for women.



Note: The y-axis shows the change in outcome for either the informal economy (IE) or equality of economic opportunity for women (WEW). The x-axis shows the time (in years) after a country ratifies the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

E.4 Extending the Pre-treatment Lag Lengths to Four Years

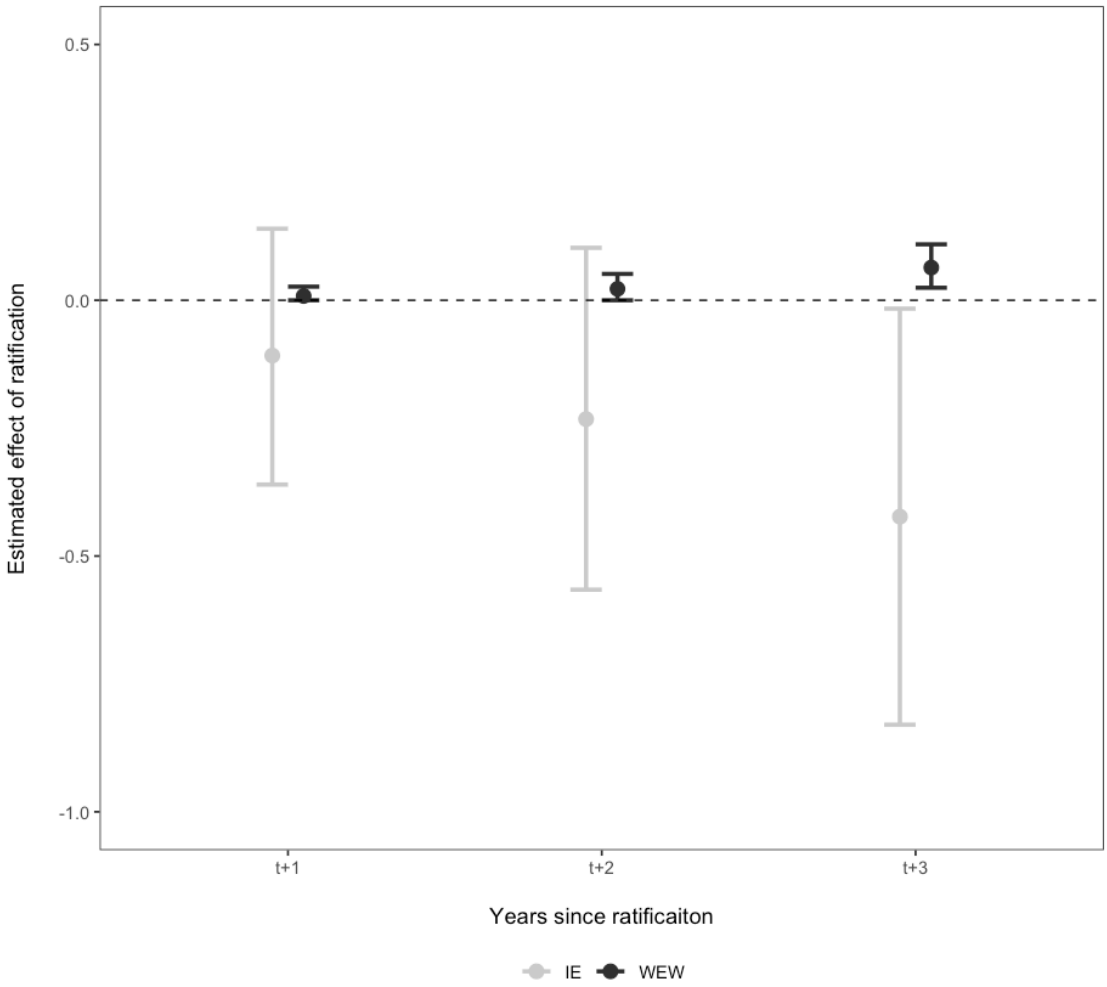
The plot below shows the results of extending the pre-treatment lag lengths for the matching of treatment, outcome, and covariate histories from three to four years. The gray estimates represent the effect of CEDAW ratification on the size of the informal economy, while the black estimates represent CEDAW's impact on equality of economic opportunity for women. As we can see, results remain nearly identical to the main analysis with the one exception that a significant decrease in the size of the informal economy occurs four years after ratification, instead of three years.



Note: The y-axis shows the change in outcome for either the informal economy (IE) or equality of economic opportunity for women (WEW). The x-axis shows the time (in years) after a country ratifies the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

E.5 Narrowing the Post-treatment Window to Three Years

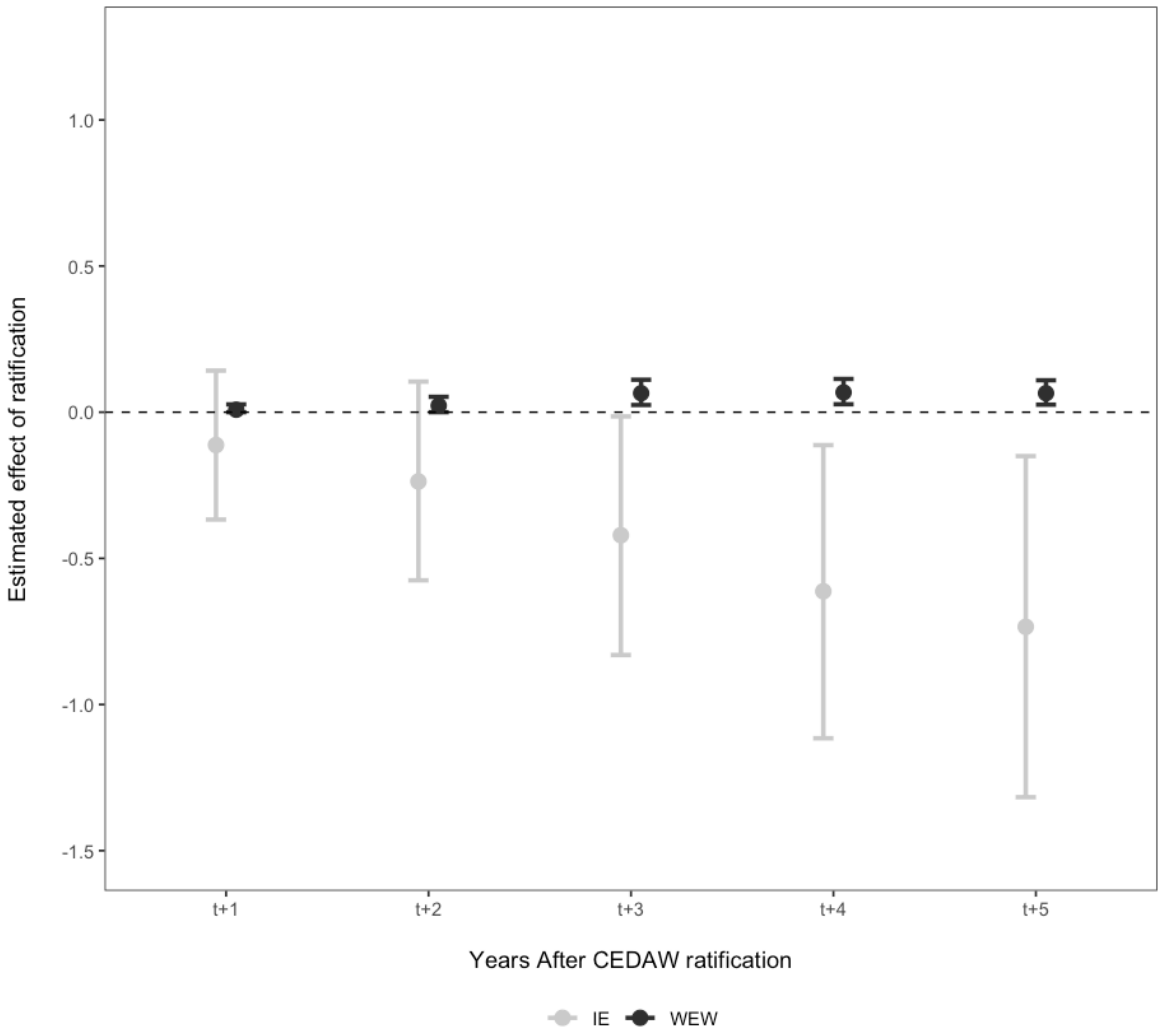
The below figure, as well as figure A15, shows that results remain unchanged from the four-year post-treatment window in the manuscript when using a three year or five year post-treatment window. Similar to the prior analyses, countries were matched and balanced on treatment, outcome, and covariate histories prior to performing a DID analysis testing CEDAW's impact on equality in economic opportunity for women, or the size of the informal economy. The gray estimates represent the effect of CEDAW ratification on the size of the informal economy, while the black estimates represent CEDAW's impact on equality of economic opportunity for women. As we can see, results remain unchanged when opting for a three-year post treatment window.



Note: The y-axis shows the change in outcome for either the informal economy (IE) or equality of economic opportunity for women (WEW). The x-axis shows the time (in years) after a country ratifies the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

E.6 Extending the Post-treatment Window to Five Years

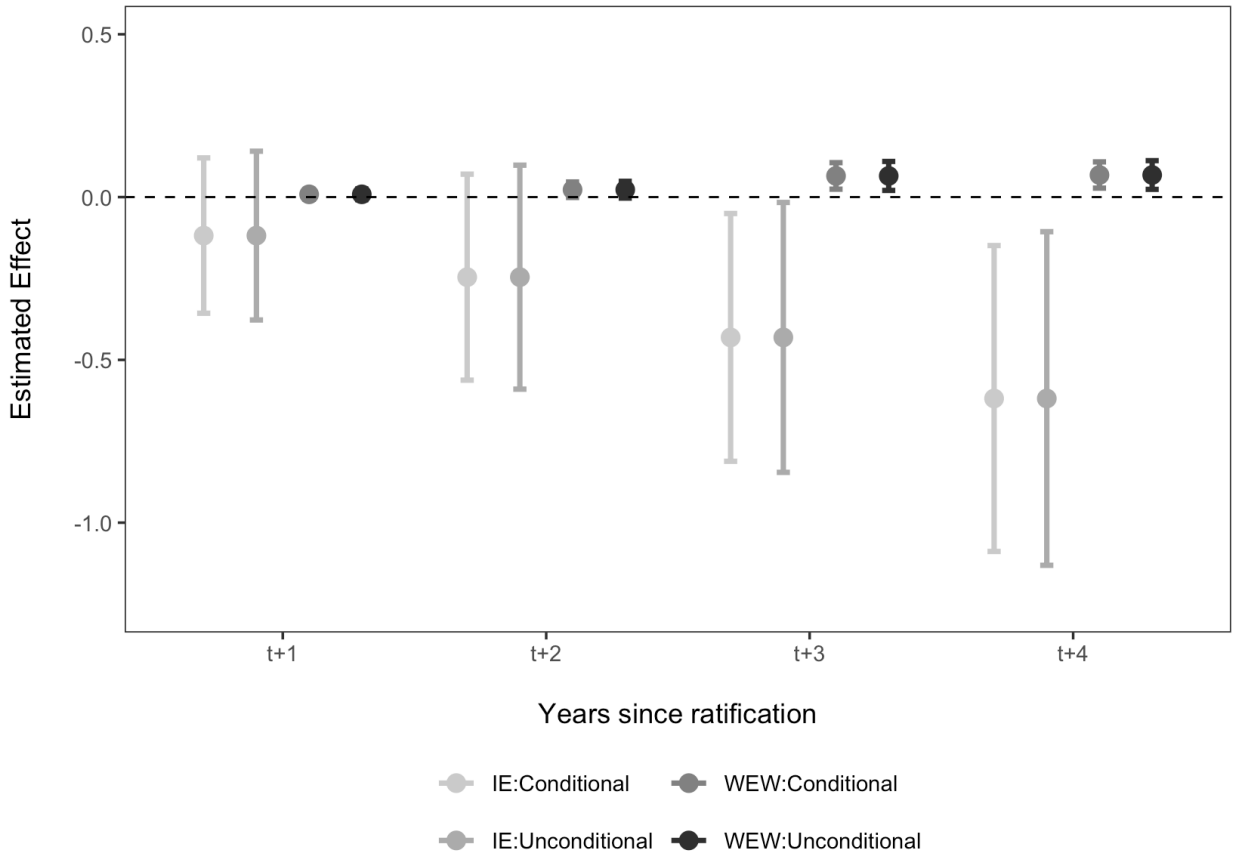
Similar to figure A14, the plot below shows that results do not change when choosing a longer post-treatment window. If anything, the results show that the informal economy continues to see a substantial decrease after CEDAW ratification, with a point estimate of nearly ¾ a percent of GDP in year t+5. Similar to the prior analyses, countries were matched and balanced on treatment, outcome, and covariate histories prior to performing a DID analysis testing CEDAW's impact on equality in economic opportunity for women, or the size of the informal economy. The gray estimates represent the effect of CEDAW ratification on the size of the informal economy, while the black estimates represent CEDAW's impact on equality of economic opportunity for women.



Note: The y-axis shows the change in outcome for either the informal economy (IE) or equality of economic opportunity for women (WEW). The x-axis shows the time (in years) after a country ratifies the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.

E.7 Results Utilizing Different Methods for Generating Standard Errors

The figure below replicates the findings in the main analysis while utilizing different methods for generating standard errors. While the main analysis utilizes block bootstrapping with 10,000 iterations to generate standard errors, the below analyses show results hold if opting for conventional standard errors—which assumes independence across units but not across time—or unconditional standard errors—which does not assume independence across units.

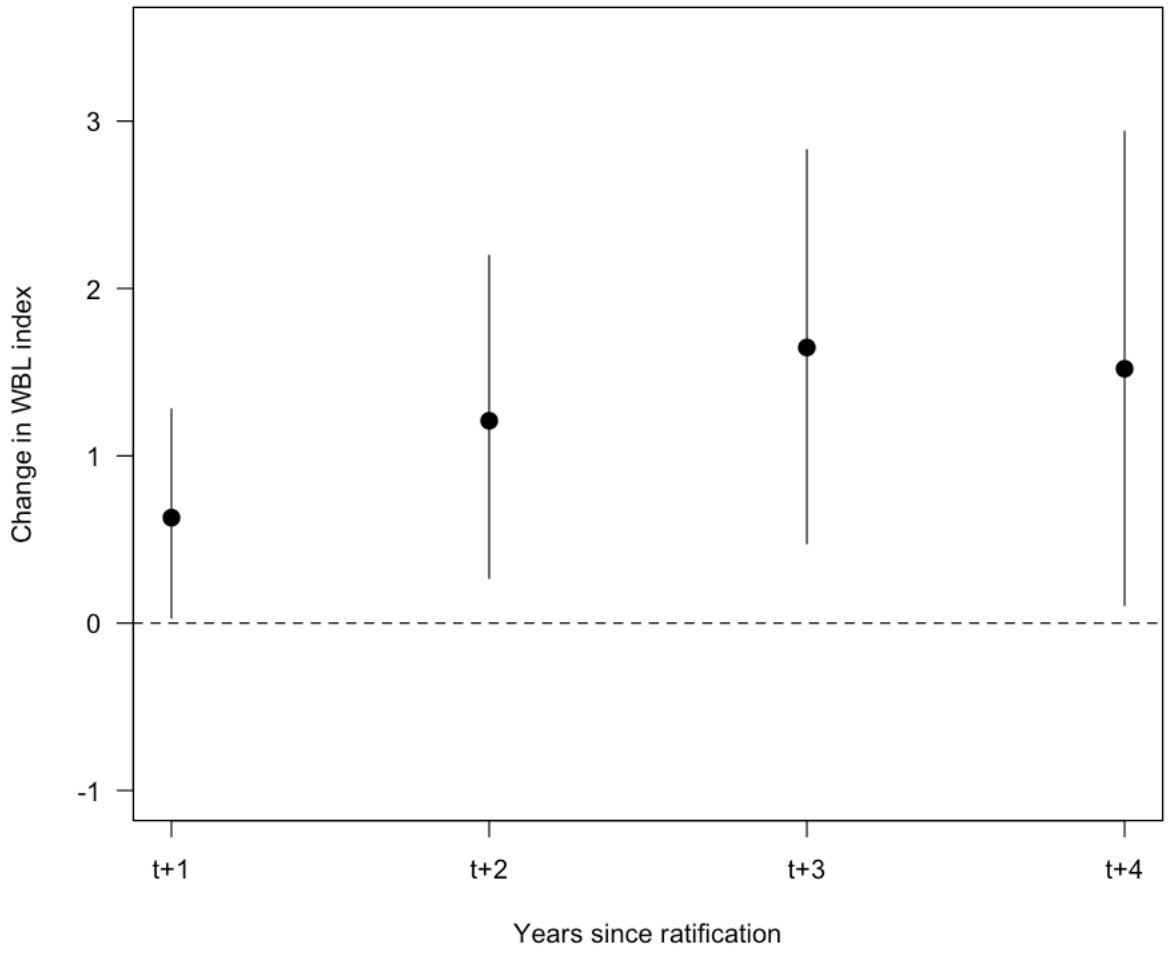


Note: The y-axis shows the change in outcome for either the informal economy (IE) or equality of economic opportunity for women (WEW). The x-axis shows the time (in years) after a country ratifies the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units using either conditional or unconditional methods to generate standard errors.

F. CEDAW and The World Bank's Women, Business and the Law Index

F.1 Impact on a Broad Range of Economic Rights for Women

The figure below estimates the Convention on the Elimination of All Forms of Discrimination Against Women's (CEDAW) impact on an alternative measure of broad economic rights for women taken from the World Bank's Women, Business and the Law (WBL) index. The WBL index measures legal rights in the areas of women's mobility, the workplace, pay, marriage, parenthood, entrepreneurship, assets, and pensions. This analysis mirrored the main analyses with the exception of removing the "credit access" variable from the matching model since this variable is part of the broader WBL index. As we can see, CEDAW ratification results in a small, but significant, increase on a composite measure of broader legal economic rights for women.



Note: The y-axis shows the change in scores for the WBL composite index of women's legal economic rights. The x-axis shows the time (in years) after a country ratifies CEDAW. Point estimates with 95% confidence intervals are generated by comparing the average difference-in-differences for ratifying countries to their matched control units and block bootstrapping standard errors with 10,000 iterations.