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

Christopher Gahagan

Florida State University

Abstract

What effects do international treaties have on domestic outcomes? While debates around selection and compliance are important, many international agreements have downstream consequences that are often overlooked due to their peripheral role in ratification decisions. In this paper I highlight a particular downstream consequence for countries who ratify the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). I argue ratification reduces the size of the informal economy by lowering formal barriers to women's employment. Through matching within a difference-in-differences design, I show ratifying countries experience a significant decrease in informality starting at three years after ratification. These results hold under multiple robustness checks and placebo tests. By demonstrating important observable implications that are peripheral to ratification decisions, I offer evidence for an overlooked political determinant of the informal economy while enhancing our knowledge of the consequences international agreements have on domestic outcomes.

What effects do international treaties have on domestic outcomes? This question 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 (Downs, Rocke, and Barsoom 1996; 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 have been 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 or no improvements to human rights protections (Cingranelli and Filippov 2018). While these debates are important, it is essential to note that many international agreements have downstream implications that are not central to a country's decision to ratify. In other words, even if countries are screening into human rights agreements, there may be important consequences that are peripheral to the core issues that motivated ratification concerns. Accounting for these downstream effects gives scholars and policymakers a greater appreciation of 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 the effects of CEDAW ratification has found mixed outcomes, with results pointing to increases in political and social rights, yet no discernable effect 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 the significance of CEDAW on women's economic outcomes for two reasons. First, improvements for women may arise in ways that aren't captured by the specific indicators utilized in many country-level reports. Focusing solely on these indicators while overlooking the broader consequences and observable implications results in a limited understanding of CEDAW's far-reaching effects. In other words, by considering these downstream effects we gain a more complete understanding of the impact treaties such as CEDAW has on women's outcomes. Second, recent advances in time-series cross-sectional (TSCS) matching within a difference-in-differences (DID) framework with staggered treatment timing enables a design-based approach to causal inference (Imai, Kim, and Wang 2021). By incorporating these advanced techniques, political scientist gain greater insight into both of CEDAW's short-term and long-term effects than previous research has afforded.

In this paper, I focus on CEDAW's impact on informal economic activity[1] – unregistered and untaxed legal activities deliberately concealed from public authorities – which comprises over two billion people globally. In addition to negative effects on the provision of public goods (Schneider 2005), informal employment often includes dangerous working conditions and increases both poverty and inequality (Bonnet, Vanek, and Chen 2019; Deléchat and Medina 2021; Malta, Kolovich, Martinez Levya, and Tavares 2021). Moreover, understanding the determinants of informal work is especially important for women's development given that in many parts of the world women are underrepresented in the formal economy (World Bank 2022a), and overrepresented in the informal economy (Deléchat and Medina 2021). I contend that although

[1] Also known as informality, informal employment, the shadow economy, and shadow or underground economic activity.

most countries are joining CEDAW for a variety of reasons, its effect on informal employment is not core to ratification concerns. Nevertheless, CEDAW ratification plays a meaningful role in reducing the size of the informal economy. While CEDAW's effect on the informal economy may work through more than one causal channel, I argue that an important mechanism involves the reduction of legal barriers towards women's formal employment. The removal of these barriers enables women, many of whom were previously forced to work informally, to gain employment in the formal sector, resulting in an overall decrease in the size of the informal economy.

To test my argument, I incorporate matching within a difference-in-differences design for time-series cross-sectional data recently developed by Imai, Kim, and Wang (2021) to capture the effect of ratification on the size of the informal economy. In the results section, I show that after matching countries on treatment, outcome, and covariate histories, CEDAW results in a significant reduction in the size of the informal economy starting around three years after ratification. Additionally, I theorize and show CEDAW's effect on the informal economy varies depending on characteristics such as economic orientation as well as prior inclusivity towards women. Moreover, I show that CEDAW ratification is responsible for a positive and significant increase in women's legal capacity to work, giving evidence towards my proposed mechanism of a reduction in formal barriers for women in the workforce. These results hold under a variety of robustness checks including whether reform minded governments are driving the results found or if other prominent human rights treaties reduce the size of the informal economy.

These findings have important substantive implications for both individuals and countries. The decrease in informal economic activity implies workers move from the informal to the formal sector, yielding additional taxable revenue for public goods provision. However, increases in a country's tax base are not the only benefit. Reducing informal employment is normatively

desirable as it often leads to less dangerous work and lower rates of poverty and inequality. Moreover, given the disproportionate number of women working informally on a global scale, reducing gender disparities in the workforce has become a focus for both academics and international organizations (Deléchat and Medina 2021; World Bank n.d.).

This work contributes to research on several different dimensions. For scholars of both international relations and human rights, I shed light on the debate around the effects that international agreements have on domestic outcomes. By demonstrating how these agreements change important peripheral outcomes that are not core to ratification decisions, I add to our understanding of the broad, and possibly overlooked, effects these treaties have. Additionally, by explicitly linking an international human rights treaty to the size of a country's informal economy, I add to both the informal economy and development literatures on the causes and consequences of informal work, while highlighting an additional pathway to sustainable growth.

Human Rights and Treaty Ratification

Downs, Rocke, and Barsoom (1996) famously argued that states comply with international agreements simply because these agreements mirror state preferences and interests. The conclusion of the argument is that entry into international agreements is an entirely endogenous act, resulting in little to no change in state behavior. Under this logic, treaties tend to "screen out" non-compliers ahead of time, leaving those who do ratify essentially in the same position had the treaty never existed at all.[2]

[2] The study of treaties often emphasize the role of compliance. Given its near universal ratification status, CEDAW is the type of treaty where we might not expect perfect compliance to occur.

Previous work on human rights treaties calls this assumption 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, yet no substantial effect on improving women's economic situation.

Given previous findings, it would appear CEDAW has failed to help out women economically. However, I argue we may be underestimating CEDAW's full effect by ignoring the

---

Nevertheless, I argue that due to the downstream nature of CEDAW's effect on the informal economy, even suboptimal compliance may result in a meaningful impact on women's economic outcomes.

downstream consequences and observable implications that comes with ratification. In particular, I draw attention to one important and often overlooked economic factor that impacts women's lives: work in the informal economy. I argue that CEDAW helps to reduce the size of the informal economy by compelling governments to eliminate legal barriers towards women's employment, thereby enabling women to move out of the informal economy and into the formal sector.

CEDAW and the Informal Economy

The worldwide informal economy is surprisingly large, consisting of roughly 61% of the global workforce (Deléchat and Medina 2021). Worryingly, large informal economies can result in many detrimental outcomes. In addition to the negative effects on tax revenues and working conditions mentioned above, large informal economies can distort macroeconomic indicators on income and unemployment rates. These distortions result in incorrect economic estimates being sent to officials and international organizations, which in turn implement policies based on this incorrect information (Elgin and Oztunali 2012). Ultimately a large informal economy acts as an obstacle to inclusive and sustainable growth, wherein many countries grow well below their true potential (Georgieva 2021; La Porta and Shleifer 2008, 2014).

Researchers studying the informal economy often point to two channels through which people or firms become informal, that of "exit" or "exclusion" (Perry et al. 2007; Tokman 2007). In the exit channel, firms and individuals work informally due to high market entry costs, lack of formal market competition, high tax burdens, poor institutional quality, or strict product and labor market regulations (Perry et al. 2007; Schneider and Enste 2000; Schneider and Williams 2013). Conversely, in the exclusion channel workers often desire employment in the formal sector, which comes with safer labor protections, higher wages, and less economic vulnerability, but they are

excluded due to legal or employment barriers, reduced labor protections, or a lack of property rights (Devine 2021).

I argue that CEDAW ratification plays a meaningful role in reducing the size of the informal economy by addressing one aspect of the exclusion channel that leads to informal work – formal employment barriers for women. Women are often the largest excluded group in the world, having on average three-quarters of the rights of men (Hyland, Djankov, and Goldberg 2020). Exclusionary or discriminatory policies towards women often result in negative economic outcomes, such as large gender gaps in labor force participation (Lagarde 2014), high levels of employment in the informal sector (Farhan et al. 2016), as well as all around less favorable outcomes in the formal labor market (Hyland, Djankov, and Goldberg 2020). In many parts of the world, exclusionary policies include official restrictions on women's employment or the permitted discrimination against women in the workforce. As a result of such policies, women have fewer formal employment opportunities, relegating them to work in the informal sector to provide for themselves and their families.

I argue that CEDAW helps to address these exclusionary barriers, thereby facilitating movement out of the informal sector and into formal employment. Specifically, articles 11 and 13 of CEDAW prohibit 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 to rectify barriers towards 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 IOs and non-governmental organizations (NGOs) to hold governments accountable through a variety of strategies such as educational programs, public naming and shaming, and domestic judicial processes.

To see how international treaty obligations change domestic practices, consider Nepal, which ratified CEDAW in 1991. Although the Nepal Treaty Act of 1990 states that international treaty provisions supersede existing domestic laws in the case of conflict (United Nations n.d.), 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).

Given the disconnect between Nepal's obligations under CEDAW and domestic legal outcomes, the NGO Pro Public worked to bring about women's rights litigation, as well as legal education programs for the judiciary. 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 educational 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).[3]

Although anecdotal, the above scenario offers one example how these processes help governments fulfill their obligations under CEDAW and promote women's equality. Crucially, these interactions between IOs, NGOs, and governments are not limited to a few countries. Even in advanced industrialized economies, CEDAW has been credited as a major contributing force in

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

overturning discriminatory practices aimed at women in Japan (Working Women's Network n.d.) and reforms to civil codes in Türkiye (Akyol 2014).

Importantly, conversations surrounding CEDAW do not mention addressing the size of a country's informal economy when considering ratification. Rather, acts such as systemic forms of violence against women (Mehra 2013), or discriminatory practices in inheritance (Hallward-Driemeier and Hasan 2012), adoption, and divorce laws (Pandey 2013) propelled domestic groups to want reform. Nevertheless, I contend that these reforms result in downstream consequences that play a meaningful role in reducing the size of the informal economy.

Additionally, I contend that CEDAW's effect on the informal economy shouldn't 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 slowed 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, bureaucracies, and society before we start to see its effects. Due to these dynamics, I argue we should expect a delay of a few years before CEDAW ratification impacts the informal economy.

CEDAW more than likely works through many different causal channels to affect the informal economy, however, I argue that one key mechanism is the elimination of legal barriers to formal employment for women. The direct implication of this process is that women gain better

access to formal work, and have reduced incentives to work informally, resulting in an overall decrease in the size of a country's informal economy.

In summary, throughout many parts of the world, women are underrepresented in the formal economy and overrepresented in the informal economy, often due to official barriers to employment. CEDAW ratification should address and help eliminate these barriers by way of domestic legislation and constant interaction between governments, IOs, and NGOs. As a consequence, women face fewer constraints to formal work, resulting in an overall decrease in informal economic activity. If true, in addition to CEDAW ratification lowering the size of the informal economy, we should also see an increase in the share of women who do not face legal employment barriers in ratifying countries. Given this, I propose the following two hypotheses

H1: 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.

H2: CEDAW ratifying countries will see an increase in the share of women who do not face legal employment barriers relative to countries that do not, or have not yet, ratified.

Heterogeneity in Treaty Impact on the Informal Sector

Above I argue why CEDAW ratification should impact the size of the informal economy globally, however, we should also expect ratification to have heterogeneous effects in different subgroups due to a variety of country characteristics. As mentioned previously, individuals work informally due to reasons found in the exit or exclusion channels, with CEDAW helping to solve one problem in the exclusion channel. Given this, CEDAW should lower informality when women are excluded from formal employment due to discriminatory practices. However, formal barriers

may not be the main constraint on women's workforce participation in every country. Rather, I expect the effect of CEDAW ratification to be more pronounced in different subgroups due to factors such as economic orientation or prior levels of inclusivity.

Economic Orientation

Previous work has shown that a country's economic orientation can affect formal employment opportunities for women. For example, Ross (2008) argues that oil rich countries suffer from a modern form of Dutch Disease, wherein 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. This suggest that women may be less likely to participate in the labor force due to economic composition rather than formal exclusion. In this scenario, CEDAW ratification may have a diminished effect on the size of the informal economy for countries heavily reliant on oil exports, while playing a significant role in reducing the informal economy for those countries not reliant on oil exports.

Similarly, I expect ratification to have a negative effect among subgroups of countries with large export-oriented manufacturing sectors. The logic here is due to the history of export-oriented firms employing women in occupations such as textiles, garments, plastics, and electronic goods (Ross 2008). Moreover, rapid growth driven by sales to a global market can increase labor demands, which may not be satisfied by men alone. While formal barriers are in place, women may be forced to work informally in various sectors of the economy. However, once barriers are eliminated, these countries can tap into this previously unavailable labor resource, or more likely, incorporate previously informal women into the formal workforce, thereby reducing the size of the informal economy. On the other hand, for countries with small export-oriented manufacturing

industries, this opportunity for women may not exist. While CEDAW ratification still reduces formal employment barriers for women in these countries, the effect may be less pronounced due limited workforce opportunities. Hence, we should expect ratification to have a negative effect on the size of the informal economy for countries that have large export-oriented manufacturing sectors, and a minimal effect, if any, on countries with medium-to-small export-oriented manufacturing sectors.

In sum, the logic above suggest that women may be less likely to participate in the labor force due to economic composition rather than formal exclusion. If my theory is correct, we should expect CEDAW to have less of an effect on the informal economy in countries largely dependent on oil or in countries with medium-to-small export-oriented manufacturing industries. Conversely, for countries not dependent on oil exports or those with large export-oriented manufacturing industries, I argue we should expect CEDAW ratification to play a meaningful role in reducing the informal economy. This leads to Hypotheses 3a and 3b regarding CEDAW's effect on the informal economy.

H3a: CEDAW ratification will reduce the size of the informal economy among countries whose economic orientation is *less dependent on oil rents,* while having a minimal effect among countries who are *more dependent on oil rents*.

H3b: CEDAW ratification will reduce the size of the informal economy among countries whose economic orientation consists of *large export-oriented manufacturing industries,* while having a minimal effect among countries with *medium-to-small export-oriented manufacturing industries*.

Prior Levels of Exclusion and Inclusion

In addition to economic orientation, we should expect ratification to have heterogenous effects based on a country's prior levels of exclusion or inclusion towards women. If CEDAW leads to reduced informal economic activity by addressing exclusionary barriers, as I argue here, then barriers must be present to begin with. Countries that are more inclusive towards women prior to ratification should experience a "ceiling effect" (Margalit 2013), leading to a much smaller reduction in the size of the informal economy, since part of the exclusion channel is already remedied. In other words, for countries with previously held norms of gender inclusion, ratification should result in a minimal impact on informal employment. Conversely, I expect countries that are more exclusive towards women prior to CEDAW ratification to have ample room for improvement, leading to a decrease in the size of their informal economy after ratification. This leads to Hypotheses 4 regarding CEDAW's effect on the size of the informal economy conditional on previous levels of inclusion or exclusion towards women.

H4: CEDAW ratification will reduce the size of the informal economy among countries that are more *exclusive* towards women prior to ratification, while having a minimal effect among countries that are more *inclusive* to women prior to ratification.

In summary, CEDAW ratification should play a meaningful role in reducing the size of the informal economy by lowering formal barriers to women's employment. However, if my theory is correct, we should expect to see heterogeneous effects due to characteristics such as a country's economic composition and prior levels of inclusivity towards women. If these additional observable implications are occurring, this bolsters the credibility of my theory regarding

CEDAW's impact on the informal economy. In other words, alternative explanations, such as reform-minded governments enacting policies that result in a reduction of the informal economy, would lack the predictive power to account for these heterogeneous effects.

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 the size of the informal economy. In particular, I utilize a time-series cross-sectional sample of 146 countries from 1978-2012,[4] 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 both CEDAW ratification and 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 size of the informal economy for ratifying $country_i$, compared to countries that had not yet ratified in the same time period. The matching and difference-in-differences method addresses endogeneity concerns by design, controls for

[4] Data on the dependent variable used in this study ends in 2012. Nearly every country that has ratified CEDAW did so prior to 2012, with only three countries having ratified the treaty after 2012 (Nauru, Palestine, and South Sudan).

unobserved confounders, and aids in causal inference by comparing the changes in outcomes before and after treatment for both treated and control groups.

Dependent Variable

The outcome of interest is the size of a country's informal economy developed by Elgin and Oztunali (2012)[5] and gathered from Blanton, Early, and Peksen (2018). To produce estimates of the informal economy, Elgin and Oztunali use a deterministic general equilibrium (DGE) model in which representative households choose between two productive technologies, formal and informal. By matching various macroeconomic proxies, Elgin and Oztunali 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.[6] The estimated size of a country's informal economy varies 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.[7]

To test my proposed mechanism of reduced formal barriers towards women in the workplace, I incorporate an indicator measuring whether there are restrictions on a woman's legal capacity to get a job from the World Bank's Women, Business and the Law (WBL) report. The

[5] 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.

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

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

WBL database attempts to capture legal inequality that affects women's economic participation and opportunities. Like similar expert-based reports, the WBL database sends out questionnaires to over 2,000 respondents who are knowledgeable in aspects of family, labor, and criminal law, often consisting of lawyers, judges, academics, and members of civil society organizations (Hyland, Djankov, and Goldberg 2020).[8] A particular strength of the WBL data is the scope and depth of its coverage, which includes 190 economies and goes as far back as the year 1970. This allows me to test the parallel trends assumption for reduced formal barriers for CEDAW's early adopters, while still offering reliable data until the end of the temporal span of the sample. Lastly, the WBL index has been shown to be correlated with better labor market outcomes for women (Hyland, Djankov, and Goldberg 2020), thus offering a useful measure to test both the mechanism and my overall theoretical expectations. 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).

Treatment Variable

To estimate CEDAW's effect on the size of the informal economy, I used Hill and Watson's (2019) coding of CEDAW ratification as my treatment variable wherein countries take a value of 1 the year CEDAW is ratified (and every year after) and 0 otherwise. As mentioned

[8] 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).

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 three 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, 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 this relationship, I matched and balanced countries on the Polity 2 index from the Polity V database developed by Marshall and Gurr (2022). The Polity 2 index assigns a value to 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 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 (current 2015 $US), the log of a country's trade (% of GDP), inflation (annual %), unemployment (% total labor force, ILO estimate), foreign direct

investment (net inflows, % to GDP), the log of net ODA received per capita, and female labor force participation rates (% of population, ILO estimate).[9]

Furthermore, previous 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 (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, Wallensteen, Eriksson, Sollenberg, et al. 2002).

In addition to differences in the above covariates, ratifying countries can have vast differences in both their respect for women's rights, as well as the robustness of their civil societies. 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 Civil Society Index from the Varieties of Democracy (VDEM) dataset (Coppedge et al. 2020). Additionally, I use an indicator measuring women's access to credit from the World Bank's Women, Business and the Law (WBL) index (World Bank 2022b). 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

[9] ILO estimates on female labor force participation do not start until 1991, leading to missing data for early ratifiers. However, the results below are unchanged whether or not this covariate is included in the matching method.

the WCL index. The credit access variable from the WBL index 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, making isolating CEDAW's effect on the informal economy hard to ascertain. Although a limited amount of treaty bundling is occurring 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. From there, I incorporated this bundling variable into the matching method to control for any confounding relationships that may arise.[10] I utilize Covariate Balancing Propensity Score Weighting (CBPS) for matching countries since this gives the best balance across covariates.[11]

Identification Strategy

To estimate the ATT, I matched treated and control countries based on treatment, outcome, and covariate histories three years prior to treatment onset. To illustrate the matching process, imagine $country_i$ ratifies CEDAW in 1990. Given the pre-treatment lag specification of three years,

[10] In particular, 30 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 the robustness checks section, I show that, unlike CEDAW, none of these other human rights treaties reduce the size of the informal economy. Moreover, in the appendix I show that results are not being driven by these countries who are bundling multiple human rights treaties at once.

[11] In the appendix I show the results found below hold when employing alternative matching specifications.

$country_i$ would match with countries that shared both identical treatment history (i.e., had not ratified CEDAW) in the three years preceding ratification (1987, 1988, and 1989), and looked similar on the important observable characteristics mentioned above.[12] The matching process resulted in 122 successful matches with an average matched set size of around 46 control countries per treated country, with control weights determined via the CBPS algorithm.

After matching, I performed a difference-in-differences analysis[13] 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.[14]

---

[12] For an in-depth explanation of the `PanelMatch` matching process, see (Imai, Kim, and Wang 2021)

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

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

The Parallel Trends Assumption

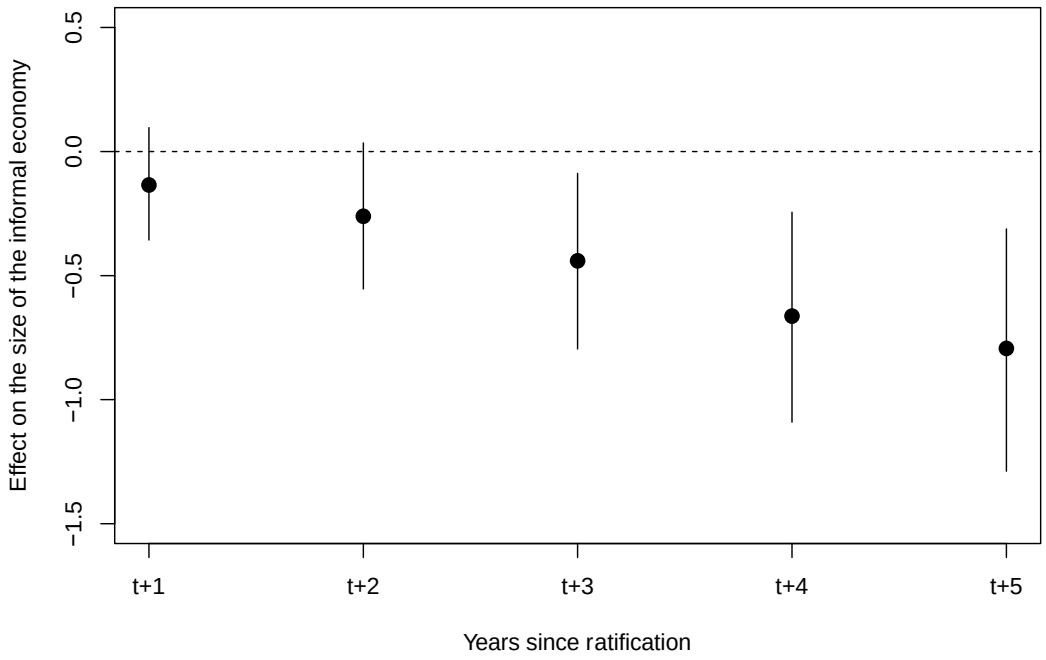
An important step to obtain causal identification in a difference-in-differences analysis is satisfying the parallel-trends assumption. In many practical applications of TSCS data, the chance for unobserved confounders is high, making it harder to satisfy the unconfoundedness assumption and threatening causal inference. However, causal inference under the parallel-trends assumption argues that after conditioning on treatment, outcome, and covariate histories, if the outcome trends are parallel, on average, between treated and control units, then any change after treatment onset can plausibly be 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, the difference between control and treatment groups is negligible (0.07 standard deviations) and consistent over time after refining the matched sets, adding confidence that the parallel trends assumption holds (Imai, Kim, and Wang 2021). Furthermore, in the appendix I run additional placebo tests advancing treatment prior to actual CEDAW ratification and show there is no effect on the size of the informal economy. If there were pre-treatment differences that violate the parallel trends assumption, we would expect these placebo tests to be significant. Showing an effect does not exist when we would not expect it to increases our confidence that 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

What effect, if any, does CEDAW have on the informal economy? As a reminder, I argue that CEDAW plays a meaningful role in eliminating barriers to formal employment for women. Once these barriers are eliminated, women face fewer constraints to formal employment, resulting in an overall decrease in informality. Figure 1 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 1. These estimates are the difference between treated countries minus their matched control countries, giving us a reasonable counterfactual comparison of CEDAW's effect on the informal economy. 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 and continues to play a role in shrinking the informal economy until at least five years after ratification.

Figure 1 Estimated Effect of CEDAW Ratification on the Size of the Informal Economy



Note: The y-axis shows the percentage point change CEDAW ratification 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.

For a substantive illustration, let's return to 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 44.67% of 3.9 billion in GDP (current US$) in 1991, the year Nepal ratified CEDAW. In the three years after ratification, Nepal's economy ebbed and flowed, eventually growing to over 4 billion in GDP (current US$) in 1994, yet the size of the informal economy decreased by 1.77 percentage points to 42.9% of GDP. Although this may seem like a modest reduction at first glance, compared to the counterfactual scenario in which Nepal does not experience a decrease, this reduction equates to just over $72 million in additional taxable revenue

for the Nepalese people.[15] A sizeable sum for a country in which the GDP per capita in 1994 was $186.6 USD (World Bank 2022c).

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 2012, the average informal economy size for countries in sub-Saharan Africa stands at 41.39% of GDP, while in Latin America and the Caribbean the average is 42.26% 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 informal sector in the three years after CEDAW ratification. Looking at OECD member countries,[16] the largest reduction in informality three years after ratification occurred in Portugal, which saw a decrease of nearly 1.5% of GDP. 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%) and the Republic of Congo (3.75%). 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%, respectively.

As I mentioned above, white most countries ratify CEDAW for a variety of reasons including reforms to penal and family laws, the potential effects on informal employment are more

---

[15] Author's own calculations.

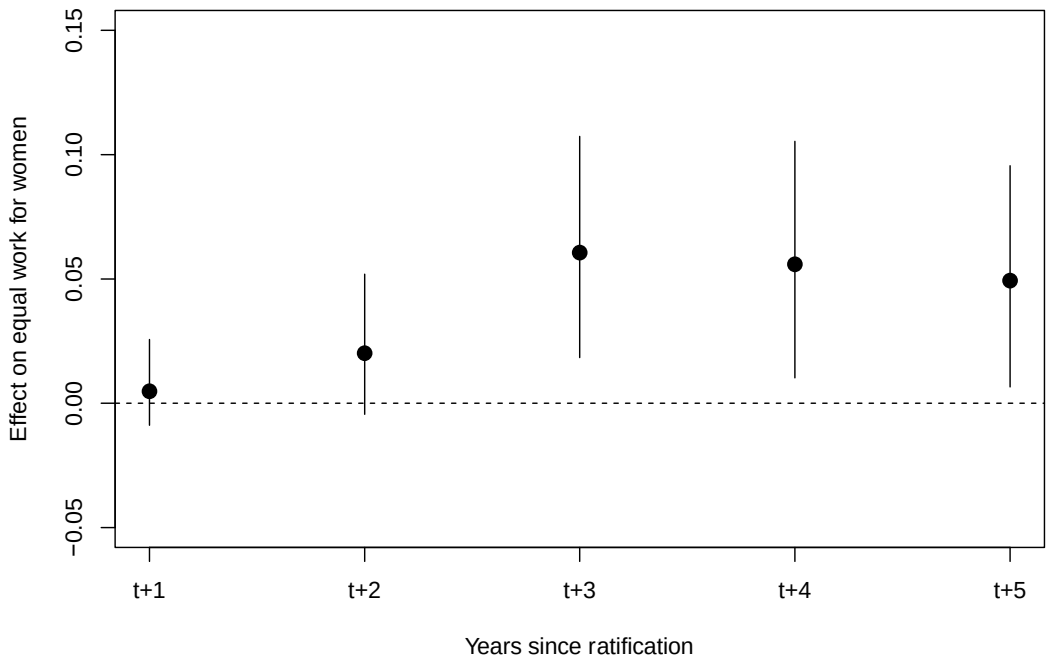
[16] In the sample, OECD countries were considered as those members belonging to the organization prior to the UNGA's adoption of CEDAW in 1979.

than likely not a core issue driving ratification decisions. Given the continued challenges that many countries face 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 downstream consequences 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.

Testing the Mechanism

The above results give support to my argument that CEDAW plays a meaningful role in reducing the size of the informal economy. Although there are arguably multiple channels through which CEDAW affects informality, I argue one important mechanism is the elimination of legal barriers to women's formal employment. Specifically, I hypothesize that CEDAW ratification leads to an increase in the rate of women allowed to seek formal employment on an equal basis with men. To test this, I performed an additional matching and difference-in-differences analysis testing CEDAW's effect on formal barriers on women's equal employment. Figure 2 shows countries that ratified CEDAW experienced a six percentage point increase in women's legal capacity to work. This result offers support for Hypothesis 2 and gives evidence of my proposed mechanism through which CEDAW works to reduce informal employment.

Figure 2 Estimated Effect of CEDAW Ratification for Women Obtaining Work on an Equal Basis with Men



Note: The y-axis shows the percentage point 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 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.

CEDAW's Heterogeneous Effects

To test Hypotheses 3a and 3b, I created dummy variables to perform subgroup analyses based on either a country's reliance on oil rents or the size of a country's export-oriented manufacturing sector. The matching and weighting procedure mirrored the previous analyses while incorporating the dummy variables as moderators into the difference-in-differences analysis. As a reminder, I argue that CEDAW should have heterogeneous effects due to a country's economic composition. Particularly, Hypothesis 3a argues that CEDAW ratification will have a significant negative effect on the size of the informal economy for those countries whose economic

orientation is less dependent on oil rents, and a minimal effect for those countries who are heavily dependent on oil rents. Hypothesis 3b states that CEDAW ratification will result in a significant reduction in the size of the informal economy for countries whose economic orientation consists of large export-oriented manufacturing industries, and a minimum effect for countries with medium-to-small industries. To test the oil rents aspect of the economic orientation hypothesis, I created a dummy variable indicating oil dependent countries taken from the World Bank's WDI database. This variable takes a value of 1 if a country's oil rents (% of GDP) are half a standard deviation above the sample mean, and a value of 0 otherwise. To test the export-oriented manufacturing aspect of the economic orientation hypothesis, I created a dummy variable for countries with large manufacturing exports taken from the World Bank's WDI database. This variable takes a value of 1 if a country's manufacturing exports (as a share of total merchandise exports minus agricultural exports) are half a standard deviation above the sample mean, and 0 otherwise.

Lastly, to test Hypothesis 4, I created a dummy variable for countries based on their pre-ratification levels of gender inclusion, gathered from the VDEM dataset. As a reminder, Hypotheses 4 argues we should expect CEDAW's impact on the informal economy to vary depending on how much room for improvement a country has. In particular, I argue CEDAW should have a significantly reduce the size of the informal economy among countries that were more exclusive towards women prior to ratification. On the other hand, for those countries that have high levels of inclusion towards women prior to ratification, we should expect minimal impact due to ceiling effects. Gender inclusion is measured on an interval scale ranging from 0 to 1 and is defined as when individuals are denied access to public services or participation based on gender in governed spaces (Coppedge et al. 2020). The variable is formed via multiple indicators

such as power distribution, equality in respect for civil liberties, access to public services, access to state jobs, and access to state business opportunities (Coppedge et al. 2020). The gender inclusion dummy variable takes a value of 1 if a country's pre-ratification gender inclusion score is half a standard deviation about the sample mean, and 0 otherwise.[17]

Table 1 shows CEDAW's heterogenous effects on the size of the informal economy and offers support for both the economic orientation and room for improvement hypotheses. For those countries whose economy is not oriented towards oil rents, the decrease in the size of the informal economy is both significant and larger than the global sample, with an estimated decrease of 0.54 percentage points. Conversely, for the subset of countries highly dependent on oil rents, the coefficient is much smaller in magnitude and not precisely estimated. Additionally, table 1 shows CEDAW's heterogeneous effects for countries with large versus medium-to-small export-oriented manufacturing industries. Ratification results in a negative but insignificant effect on the size of the informal economy for the subset of countries with medium-to-small export-oriented manufacturing sectors. In contrast, for those countries with large export-oriented manufacturing sectors, ratification results in a significant reduction in the size of the informal economy. In fact, these countries see the largest decline in the sample, with a decrease of nearly 1 percentage point three years after ratification.

Staying with table 1, we see that CEDAW's effect on the informal economy is also dependent on how much room for improvement there is in a country. While CEDAW ratification results in a negative effect on the size of the informal economy for inclusive countries, the estimate is imprecise and not significant at conventional levels. However, for those countries that were

[17] Gender inclusion is recoded so that higher values represent more inclusion rather than exclusion.

more exclusive towards women prior to CEDAW, ratification results in a significant decrease in the size of the informal economy, with an estimated decrease of half a percentage point, significant at the .05 level.

Table 1 Estimated Effect of CEDAW Ratification on the Size of the Informal Economy

Sample	Estimate	95% Confidence intervals
Global estimate	-0.44* (0.18)	[-0.80 , -0.08]
Oil dependence (high)	0.10 (0.71)	[-1.35 , 1.45]
Oil dependence (low)	-0.54** (0.19)	[-0.91 , -0.18]
Export manufacturing (high)	-0.97** (0.36)	[-1.73 , -0.31]
Export manufacturing (low)	-0.12 (0.29)	[-0.68 , 0.46]
Prior inclusive countries	-0.30 (0.27)	[-0.82 , 0.24]
Prior exclusive countries	-0.50* (0.22)	[-0.94 , -0.08]

Note: Estimates are the difference-in-differences between treated and matched controls units three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations and are shown in parentheses.
† $p<0.10$ * $p<0.05$ ** $p<0.01$.

Taken together, the results for Hypotheses 3 and 4 suggests that a country's economic orientation, as well as prior levels of inclusivity towards women, plays an important role for whether CEDAW ratification will help move women out of the informal economy and into formal work. After ratification, countries with an economic orientation towards large export-oriented

manufacturing industries are able to tap into previously unavailable labor pools, or formalize previously informal working women, resulting in an overall reduction in the size of the informal economy. Conversely, countries who are highly reliant on oil rents may see their economic orientation shift to non-tradeable sectors that traditionally employ men, thereby limiting the opportunities for women in the workforce. In other words, while CEDAW addresses many legal obstacles towards women working formally, there may be other economic factors at work which CEDAW is unable to remedy.[18]

Lastly, if CEDAW lowers exclusionary barriers to formal work for women, then barriers must be present to begin with. For those countries who were previously inclusive towards women prior to CEDAW, potential ceiling effects may be occurring, thereby limiting CEDAW's impact on the informal economy. In short, the barriers that CEDAW is meant to remedy have already been eliminated. On the other hand, for those countries that were more exclusive towards women prior to CEDAW, and therefore were highly likely to have had formal employment barriers in place, we see a notable and significant decrease in the size of the informal economy.

In summary, the results above offer supporting evidence for Hypotheses 1 through 4. CEDAW ratification results in a reduction in the size of the informal economy on a global sample, however there are heterogeneous effects depending on a country's economic orientation, and prior levels of exclusion or inclusion towards women. Additionally, I find support for my proposed

[18] Ross' (2008) article addresses a debate between scholars around the role Islam or Arab culture has on women's rights. In the appendix, I show that the results for oil rents hold when exact matching on middle eastern countries is included in the model.

mechanism that CEDAW's effect on the informal economy works through the elimination of legal barriers to formal work for women.

Ideally we'd be able to test my claims using informal economic activity by gender. Yet, as noted above, these data are scarce and do not cover the time period when most countries ratified CEDAW. However, I contend that the results found should increase our confidence in my argument for two reasons. First, it seems unlikely that a treaty specifically aimed at protecting the rights of women would result in men leaving the informal sector, therefore contributing to the overall decrease in informal economic activity. Secondly, I both theorize and demonstrate where heterogeneous effects of ratification should exist. Factors such as economic orientation as well as a country's previous levels of exclusion towards women result in varying degrees to which CEDAW impacts the informal economy. Given these heterogeneous effects, it is difficult to explain the variation we see in informal economic activity if ratification has no effect on women moving out of the informal economy as I propose.

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 the appendix, 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.[19]

To address endogeneity concerns I perform additional tests to see if high levels of gender inclusion or large informal economies are leading countries to ratify CEDAW. While these variables are controlled for in the main analyses, the results for both robustness checks are insignificant. Neither high levels of informality nor high levels of gender inclusion predict CEDAW ratification, giving us 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, incorporating different matching algorithms, as well as adding in the heterogeneous treatment variables from above into the matching process. The analyses for these additional tests show the results found are not sensitive to the modeling specification used. All tests show CEDAW's effect on the informal economy to be in the same direction and statistically significant.

In addition to my findings being robust to different modeling specifications, I also show my findings hold to rival alternative explanations. For example, a plausible alternative explanation

---

[19] In the appendix I show CEDAW ratification leads to a 10 percentage point increase in the probability that a country will move from a lower category (0 or 1) to a higher category (2 or 3) for CIRIGHTS' Women's Economic Rights indicator. Substantially, this difference means moving from having little to no laws or enforcement for women's economic rights, to having both formal laws and effective enforcement guaranteeing these rights. Moreover, I also show ratification leads to a significant increase in broad economic rights for women using an alternative measure from the World Bank's Women, Business and the Law index.

is that the results found are not due to CEDAW ratification, but rather are the product of reform-minded governments aiming to improve women's rights once they come into power. This scenario could involve these reform-minded governments enacting domestic legislation at the same time a country ratifies CEDAW, causing the results I find. To test this possibility, I created a variable from the V-Party dataset (Lührmann et al. 2020) that takes a value of 1 if a party moves into power in a given country, thereby becoming Head of Government, and strongly support 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 newly elected, reform-minded governments coming into power with a desire to increase women's labor participation. In the appendix I show that CEDAW ratification has a statistically insignificant effect on the size of the informal economy for these reform-minded governments, while still causing a significant reduction in the size of the informal economy for the subset of countries with non-reform minded governments.

Alternative Human Rights Treaties and International Signaling

Another rival explanation is the possibility that a reduction in the informal economy is due to signing any human rights treaty rather than CEDAW specifically. In this scenario, rather than increasing women's rights and facilitating movement out of the informal economy as I argue, ratification of prominent human rights treaties act as a signaling device to the international community, or spurn other domestic action that leads to a decrease in the size of the informal economy. The logic here rests on the idea that by ratifying popular treaties, countries signal to potential investors that they are a good place to do business. Once a country sends out this signal,

different forms of investment or development aid enter into the country and create new economic opportunities, resulting in a decrease in the informal economy.

To investigate whether this alternative interpretation is driving the results I find, I perform multiple placebo tests using difference-in-differences analyses on the size of the informal economy for several prominent human rights treaties. Specifically, I incorporate ratification data for every country in my sample for 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), Convention on the Rights of Persons with Disabilities (CRPD), International Covenant on Civil and Political Rights (ICCPR), and the International Covenant on Economic, Social, and Cultural Rights (ICESCR). Table 2 shows the estimated effect of ratifying each human rights treaty on the size of the informal economy three years after ratification. As we can see, none of the other prominent human rights treaties have a significant impact on the size of the informal economy, which is exactly what we would expect to see given a placebo test of this nature. The results give further credibility to my theory that it is CEDAW specifically that is leading to a reduction in the informal economy rather than other prominent human rights treaties acting as a signaling device. Additionally, in the appendix I show that CEDAW ratification does not lead to additional economic investments that could plausibly impact the informal economy. Specifically, I show that ratification does not lead to an increase in GDP per capita, trade flows, FDI, or official development assistance.

Table 2 Ratification of Alternative Human Rights Treaties on the Size of the Informal Economy

Treaty	Estimate	95% Confidence intervals
CRC	0.04 (0.34)	[-0.53 , 0.77]
CERD	0.63 (0.74)	[-0.55 , 2.34]
ICESCR	0.17 (0.31)	[-0.54 , 0.97]
CAT	0.06 (0.21)	[-0.34 , 0.48]
CRPD	0.33 (0.85)	[-0.70 , 2.56]
CMW	0.01 (0.55)	[-0.92 , 1.26]
ICCPR	-0.06 (0.30)	[-0.65 , 0.54]

Note: Estimates are the difference-in-differences between treated and matched controls three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations and are shown in parentheses. The models for each respective treaty were matched and balanced via CBPS weighting and a three year lag, similar to the main analysis. † $p<0.10$ * $p<0.05$ ** $p<0.01$.

Conclusion

The effects international treaties have on domestic outcomes has, and will continue to be, a hotly debated topic. Yet, regardless of where one falls in this debate, these treaties often have important downstream effects that are peripheral to ratification concerns. In this paper I show how a seemingly political treaty aimed at improving women's lives, CEDAW, helps to reduce the size of the informal economy for ratifying countries. Utilizing matching and difference-in-differences

for TSCS data, I show that ratification results in a significant reduction in the size of the informal economy by nearly half a percentage point for a global sample. Furthermore, I offer evidence of one potential mechanism through which CEDAW works – the reduction of legal barriers to employment for women.

Reducing the informal economy results in additional taxable revenue that can help fund much needed public goods provision in addition to normatively desirable outcomes such as less dangerous work and lower rates of poverty and inequality. Although Nepal's hurdles were used as an illustrative example above, the issues experienced are similar for many countries. For example, between 2004 – 2010, up to 95 percent of women workers in Southern Asia were employed informally (UN Women 2015). In Sub-Saharan Africa, these shares have been reported to reach 94 percent (Malta, Kolovich, Martinez Levya, and Tavares 2021). Given the disproportionate number of women working informally on a global scale, understanding the determinants of informal work is critical for achieving sustainable development and equitable inclusion.

Additionally, I show the heterogeneous effects CEDAW has on women's informal employment due to factors such as economic orientation or prior levels of inclusivity. Ratification was shown to decrease the size of the informal economy in countries with low oil dependence, countries with large export-oriented manufacturing sectors, and in countries with exclusionary policies towards women prior to ratification. Moreover, this decrease is unique to CEDAW. Robustness checks testing difference-in-differences of several prominent human rights treaties shows these other treaties have no significant impact on the size of the informal economy.

Lastly, I argue this paper highlights an important question scholars of international relations should be asking: What are some other potentially important downstream effects of international treaties? Although normatively positive effects such as CEDAW leading to a reduction in the

informal economy can occur, there may also be negative downstream consequences due to ratifying international agreements. One example of this possibility could involve ratification of the Convention Against Torture leading countries to develop "enhanced interrogation techniques," such as those used by the United States during the global war on terror. Another possibility may involve variation in the protections afforded in trade agreements giving rise to anti-democratic politicians feeding off of popular discontent. While isolating what is driving the vitriol aimed at "Brussels" by far-right nationalist parties in Europe may prove difficult, it seems plausible that the backlash these groups are displaying is consequence of an existing international agreement. While we can, and should, have debates about compliance in international treaties, recognizing their important downstream effects and observable implications allows us to appreciate the full scope, 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.

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): 309–333.

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

Cingranelli, David, and Mikhail Filippov. 2018. “Are Human Rights Practices Improving?” American Political Science Review 112(4): 1083–1089.

Coppedge, Michael et al. 2020. “Methodology V10.” SSRN Electronic Journal. https://www.ssrn.com/abstract=3557904.

Deléchat, Corinne C., and Leandro Medina. 2021. The global informal workforce: priorities for inclusive growth. Washington, DC, USA: International Monetary Fund, Publications Services.

Devine, Hilary. 2021. “How Institutions Shape the Informal Economy.” In The Global Informal Workforce: Priorities for Inclusive Growth, Washington, DC, USA: International Monetary Fund, Publications Services, p. 220:250.

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.

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.

Farhan, Fiza et al. 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.

Fariss, Christopher J. 2019. “Yes, Human Rights Practices Are Improving Over Time.” American Political Science Review 113(3): 868–881.

Georgieva, Kristalina. 2021. “Foreword.” In The global informal workforce: priorities for inclusive growth, Washington, DC, USA: International Monetary Fund, Publications Services.

Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg, et al. 2002. “Armed Conflict 1946-2001: A New Dataset.” Journal of Peace Research 39(5): 615–637.

Goodman-Bacon, Andrew. 2021. “Difference-in-differences with variation in treatment timing.” Journal of Econometrics 225(2): 254–277.

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): 407–425.

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.

Hallward-Driemeier, Mary, and Tazeen Hasan. 2012. Empowering Women: Legal Rights and Economic Opportunities in Africa. The World Bank. http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-9533-2.

Hathaway, Oona A. 2001. "Do Human Rights Treaties Make a Difference?" The Yale Law Journal 111.

Hill, Daniel W. 2010. "Estimating the Effects of Human Rights Treaties on State Behavior." The Journal of Politics 72(4): 1161–1174.

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): 127–138.

Hoffman, Steven J. et al. 2022. "International treaties have mostly failed to produce their intended effects." Proceedings of the National Academy of Sciences 119(32): e2122854119.

Hyland, Marie, Simeon Djankov, and Pinelopi Koujianou Goldberg. 2020. "Gendered Laws and Women in the Workforce." American Economic Review: Insights 2(4): 475–490.

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.

La Porta, Rafael, and Andrei Shleifer. 2014. "Informality and Development." Journal of Economic Perspectives 28(3): 109–126.

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

Lagarde, Christine. 2014. “The Economic Power of Women’s Empowerment, Keynote Speech By Christine Lagarde, Managing Director, International Monetary Fund.”

Lührmann, Anna, Nils D• üpont, Masaaki Higashijima, Yaman Berker Kavasoglu, Kyle L. Marquardt, Michael Bernhard, Holger D• öring, Allen Hicken, Melis Laebens, Staffan I. Lindberg, Juraj Medzihorsky, Anja Neundorf, Ora John Reuter, Saskia Ruth-Lovell, Keith R. Weghorst, Nina Wiesehomeier, JosephWright, Nazifa Alizada, Paul Bederke, Lisa Gastaldi, Sandra Grahn, Garry Hindle, Nina Ilchenko, Johannes Von R• ömer, Steven Wilson, Daniel Pemstein, Brigitte Seim. 2020. “V-Party Dataset v1.” https://www.v-dem.net/vpartyds.html.

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, Washington, DC, USA: International Monetary Fund, Publications Services, p. 188:217.

Margalit, Yotam. 2013. “Explaining Social Policy Preferences: Evidence from the Great Recession.” American Political Science Review 107(1): 80–103.

Marshall, Monty G., and Ted Robert Gurr. 2022. “‘Polity5: Political regime characteristics and transitions, 1800-2018.’ Dataset Users’ Manual.” https://www.systemicpeace.org/inscr/p5manualv2018.pdf.

Mehra, Madhu. 2013. “India’s CEDAW story.” 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, p. 385–409.

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, p. 410–429.

Perry, Guillermo E. et al. 2007. Informality: Exit and Exclusion. The World Bank. http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-7092-6.

Richards, David, and Ronald Gelleny. 2007. “Women’s Status and Economic Globalization.” International Studies Quarterly 51(4): 855–876.

Ross, Michael L. 2008. “Oil, Islam, and Women.” American Political Science Review 102(1): 107–123.

Schneider, Friedrich. 2005. “Shadow economies around the world: what do we really know?” European Journal of Political Economy 21(3): 598–642.

Schneider, Friedrich, Andreas Buehn, and Claudio E. Montenegro. 2010. “New Estimates for the Shadow Economies all over the World.” International Economic Journal 24(4): 443–461.

Schneider, Friedrich, and Dominik H Enste. 2000. “Shadow Economies: Size, Causes, and Consequences.” Journal of Economic Literature 38(1): 77–114.

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): 819–835.

Simmons, Beth A., and Daniel J. Hopkins. 2005. “The Constraining Power of International Treaties: Theory and Methods.” American Political Science Review 99(4): 623–631.

Teobaldelli, Désirée, and Friedrich Schneider. 2013. “The influence of direct democracy on the shadow economy.” Public Choice 157(3–4): 543–567.

Tokman, Víctor E. 2007. “The informal economy, insecurity and social cohesion in Latin America.” International Labour Review 146(1–2): 81–107.

UN Women, United Nations Entity for Gender Equality and the Empowerment of Women, ed. 2015. Progress of the world’s women 2015-2016: Transforming economies, realizing rights. New York, NY: UN Women.

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. “Nepal Treaty Act, 1990.” https://www.refworld.org/legal/legislation/natlegbod/1990/en/74241.

United Nations General Assembly. 1979. 13 Convention on the Elimination of All Forms of Discrimination against Women. The United Nations.

Verveer, 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.” 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): 611–622.

Vreeland, James Raymond. 2008. “Political Institutions and Human Rights: Why Dictatorships Enter into the United Nations Convention Against Torture.” International Organization 62(01). http://www.journals.cambridge.org/abstract_S002081830808003X.

Wooldridge, Jeff. 2007. “What’s new in econometrics? Lecture 10 difference-in-differences estimation.” NBER Summer Institute, available at: www. nber. org/WNE/Slides7–31–07/slides_10_diffindiffs. pdf.

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. “THE 17 GOALS | Sustainable Development.” Department of Economic and Social Affairs. https://sdgs.un.org/goals.

World Bank. 2022b. “Women, Business and the Law.” https://wbl.worldbank.org/en/methodology#a.

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

Appendix

Table of Contents

Table A1. Summary Statistics

Below are summary statistics for the variables used in the main analysis and the analyses investigating CEDAW's heterogeneous effects.

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
Informal Economy Size (% GDP)	4620	34	13	8	25	43	82
Conflict	4598	0.21	0.5	0	0	0	2
Inflation (Annual %)	3991	38	475	-18	2.8	12	23773
Unemployment (%, ILO)	3061	8	6.4	0.3	3.7	10	39
FDI (net inflows, % GDP)	4376	3	8.6	-58	0.34	3.5	280
Trade (log, % GDP)	4185	4.2	0.56	1.8	3.8	4.5	6.1
Equal Work for Women	4620	0.77	0.42	0	1	1	1
Credit Access	4620	0.89	0.31	0	1	1	1
Gender Inclusion (GI)	4620	0.58	0.26	0.026	0.36	0.83	0.98
GDP per capita (log)	4432	7.7	1.6	4.6	6.4	8.9	12
Polity 2	4573	2.2	7.1	-10	-6	9	10
Oil Rents (% GDP)	4373	3.8	9.4	0	0	1.4	79
Oil High (Dummy)	4373	0.13	0.34	0	0	0	1
High GI Dummy	4620	0.3	0.46	0	0	1	1
High GI Dummy (pre-ratification)	4620	0.054	0.23	0	0	0	1
Women's Civil Liberties (WCL)	4620	0.65	0.25	0	0.5	0.86	0.98
High WCL Dummy (pre-ratification)	4620	0.056	0.23	0	0	0	1
High WCL Dummy	4620	0.28	0.45	0	0	1	1
Manufacturing Exports (% GDP)	3596	14	6.4	0	9.2	18	50
Fuel Exports (% merchandise exports)	3232	0.16	0.26	0	0.0087	0.16	1
Agricultural Exports (% Merch exports)	3329	0.056	0.097	0	0.0088	0.059	0.89
Manufac. Exports (% Merch exports)	3323	0.43	0.31	0	0.13	0.72	3.7
Merch Exports (current USD)	4563	3823619482	1115200532	2000000	60950000	209710000	1577750000
Manufactures Exports (current USD)	3313	3440559003	1002899623	0	23654525	171328961	1476616222
Agricultural Exports (current USD)	3319	1077538535	2805662852	0	27288714	767770267	4087117250
Manufacturing (Manuf. Exports / (Merch exports– Agri exports))	3303	0.45	0.31	0	0.14	0.75	3.8
Net Official Development Assistance (per capita)	3445	49	64	-7.1	12	60	711
Female Labor Force Participation (ILO estimate)	3061	55	17	8.1	46	67	91
ODA per capita (log)	3429	3.2	1.3	-6.1	2.5	4.1	6.6
Civil Society Organizations (V-Dem)	4620	0.63	0.29	0.013	0.37	0.89	0.98
Women Business and the Law index	4620	59	18	18	47	71	100

Figure A1. Distribution of Matched Sets – CBPS Weighting

The below plot shows the distribution and frequency of matched sets. The red line on the left of the plot shows only five treated countries in the sample were unable to be matched with any control countries.

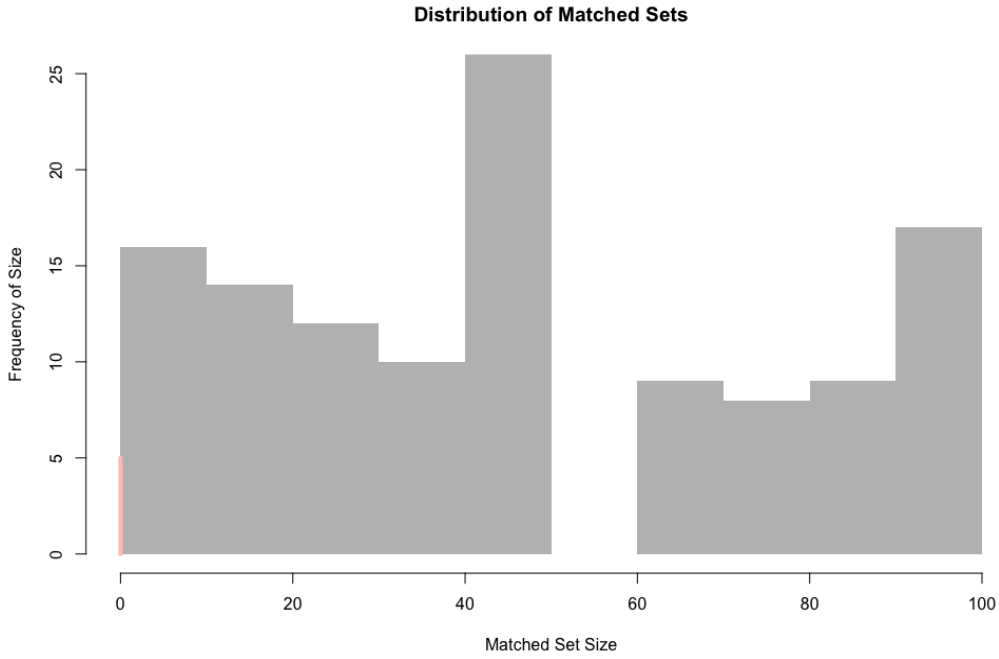


Figure A2. Distribution of Informal Economic Activity in the Sample

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

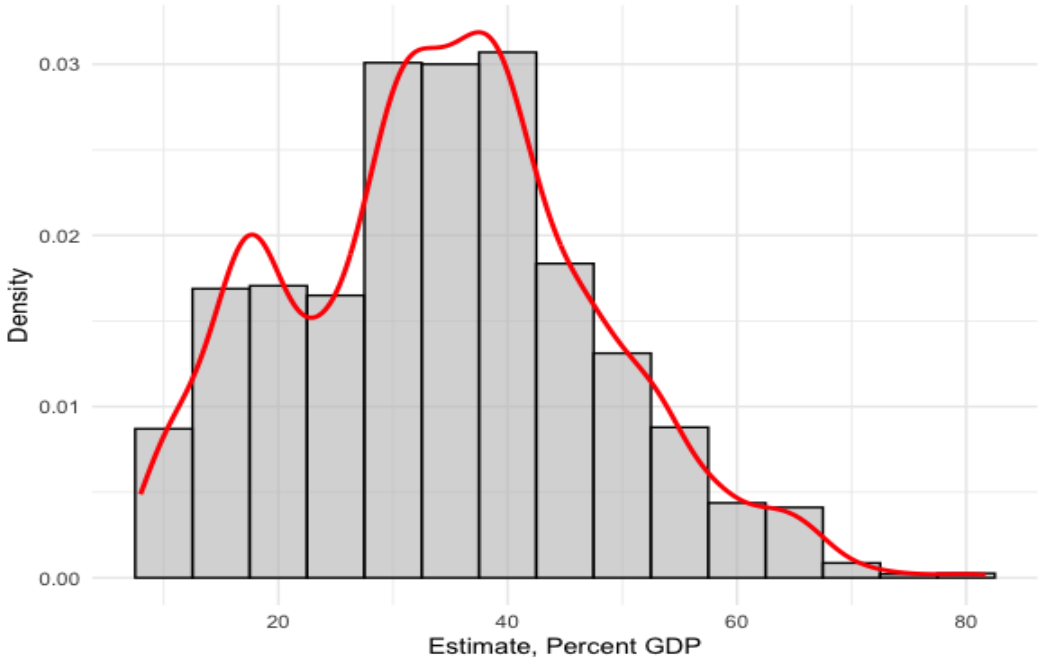


Table A2. Covariate Balance

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	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib	ODApc(ln)	Fem. Lab. Force
t-3	0.2501	0.1433	0.9874	0.2525	0.1273	0.115	-0.2097	0.2925	-0.0095	0.2027	0.1969	0.1872	0.2246
t-2	0.2759	0.0166	0.9431	0.1659	0.1454	0.189	-0.1261	0.3525	0.0674	0.1535	0.1922	0.1657	0.1091
t-1	0.2724	-0.0301	0.8265	0.1378	0.2073	0.2147	-0.1533	0.39	0.0228	0.1588	0.1995	0.1446	0.0896

CBPS

Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib	ODApc(ln)	Fem. Lab. Force
t-3	0.0361	0.2182	1.2138	0.4513	0.0083	0.003	0.0005	0.0687	-0.0148	0.0197	-0.0126	0.3961	0.0993
t-2	0.0657	0.1328	1.1416	0.3795	0.0131	0.0322	-0.0128	0.0779	0.0296	-0.0036	-0.013	0.3694	0.1005
t-1	0.0761	0.1436	1.0852	0.3604	0.0262	0.0506	-0.0131	0.1812	0.0405	-0.0131	-0.0212	0.3565	0.0475

PSW

Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib	ODApc(ln)	Fem. Lab. Force
t-3	0.0246	0.217	1.1646	0.4368	-0.0355	-0.036	0.0209	0.1147	-0.0087	0.0122	-0.0357	0.3761	0.081
t-2	0.0532	0.1408	1.0944	0.3616	-0.0236	-0.0051	0.0061	0.1105	0.0205	-0.0108	-0.0333	0.3579	0.1207
t-1	0.0641	0.1469	1.0164	0.3159	-0.0018	0.0200	-0.0002	0.2051	0.0348	-0.0065	-0.0353	0.3416	0.0832

MDM

Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib	ODApc(ln)	Fem. Lab. Force
t-3	0.1807	0.2692	-0.0275	-0.0289	0.0378	0.0522	-0.0956	0.1138	0.0924	0.0782	0.0898	-0.21	0.1459
t-2	0.2075	0.1505	0.0243	-0.0577	0.0574	0.1376	-0.0378	0.2047	0.1885	0.0377	0.0913	-0.2261	0.0931
t-1	0.2072	0.0863	0.0389	-0.0209	0.1101	0.1559	-0.0301	0.2821	0.1239	0.0603	0.0979	-0.1966	0.0900

Figure A3. Parallel Trends Plot: Main Analysis

The two figures below shows the trends between treated and control units prior to treatment onset for informal economy size (A3) or Equal Work for Women (A4). 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.

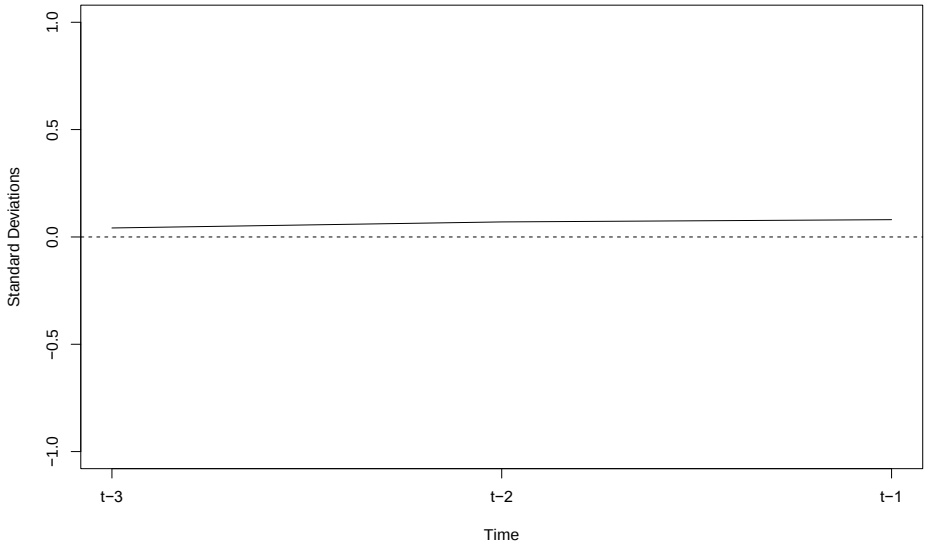


Figure A4. Parallel Trends Plot: World Bank's Women and Equal Work

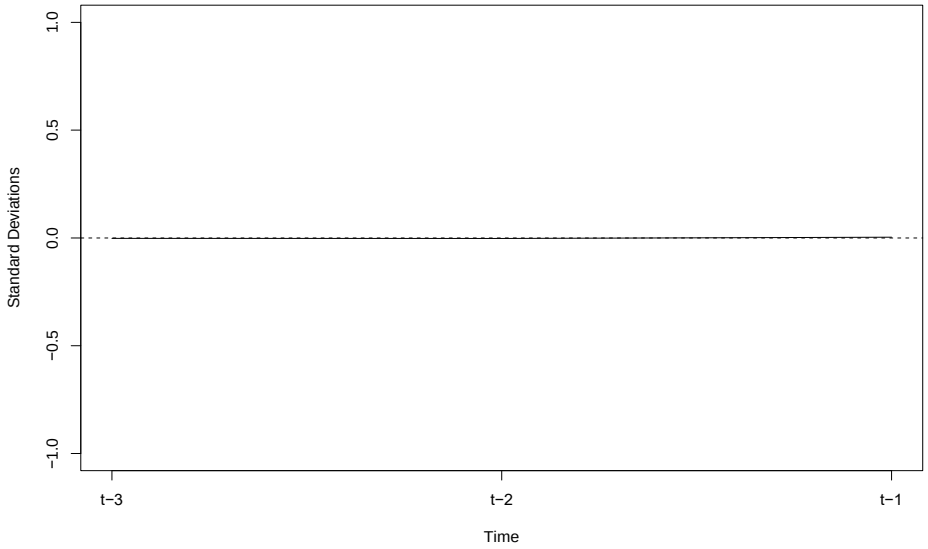


Table A3. Placebo Test: Advancing ratification timing

The below table shows placebo tests advancing CEDAW's ratification by one, two, or three years. The goal is to make sure there is not an effect when we wouldn't expect there to be one.

Ratification Advanced by:	Estimate	Std. Error	95% Conf. Intervals
One Year	-0.25	0.16	[-0.57 , 0.58]
Two Years	0.08	0.17	[-0.27 , 0.41]
Three Years	0.26	0.21	[-0.14 , 0.69]

Note: Because treatment timing is advanced, matches are slightly different compared to the main model. Estimates are the difference-in-differences between treated and matched controls three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations: † p<0.10 * p<0.05 ** p<0.01

Table A4. Covariate Balancing Propensity Score Weighting (5 lags)

The below table shows global estimates and heterogeneous effects of CEDAW ratification on the informal economy using extended pre-treatment lag lengths in the matching model.

Sample	Estimate	Std. Error	95% Conf. Intervals
Global Estimate	-0.39*	0.20	[-0.81 , -0.04]
Oil Dependence (High)	0.19	0.42	[-0.62 , 1.03]
Oil Dependence (Low)	-0.53**	0.22	[-1.00 , -0.13]
Export Manufacturing (High)	-1.08**	0.39	[-1.94 , -0.42]
Export Manufacturing (Low)	0.05	0.27	[-0.49 , 0.58]
Prior Inclusive Countries	-0.31	0.30	[-0.95 , 0.21]
Prior Exclusive Countries	-0.43†	0.23	[-0.91 , 0.02]

Note: Estimates are the difference-in-differences between treated and matched controls units three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations: † p<0.10 * p<0.05 ** p<0.01

Table A5. Alternative matching methods: Propensity Score Weighting

The below table shows global estimates and heterogeneous effects of CEDAW ratification on the informal economy using propensity score weighting as an alternative matching method.

Sample	Estimate	Std. Error	95% Conf. Intervals
Global Estimate	-0.42*	0.18	[-0.76 , -0.07]
Oil Dependence (High)	0.04	0.61	[-1.20 , 1.21]
Oil Dependence (Low)	-0.52**	0.19	[-0.90 , -0.16]
Export Manufacturing (High)	-1.00 **	0.33	[-1.70 , -0.38]
Export Manufacturing (Low)	-0.10	0.28	[-0.65 , 0.47]
Prior Inclusive Countries	-0.28	0.26	[-0.79 , 0.24]
Prior Exclusive Countries	-0.48*	0.22	[-0.89 , -0.05]

Note: Estimates are the difference-in-differences between treated and matched controls units three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations: † p<0.10 * p<0.05 ** p<0.01

Table A6. Alternative matching: Mahalanobis Distance Matching

The below table shows global estimates and heterogeneous effects of CEDAW ratification on the informal economy using Mahalanobis distance matching as an alternative matching method.

Sample	Estimate	Std. Error	95% Conf. Intervals
Global Estimate	-0.43*	0.19	[-0.79 , -0.08]
Oil Dependence (High)	0.25	0.66	[-1.07 , 1.55]
Oil Dependence (Low)	-0.56**	0.20	[-0.96 , -0.17]
Export Manufacturing (High)	-0.88**	0.34	[-1.57 , -0.24]
Export Manufacturing (Low)	-0.1	0.29	[-0.66 , 0.47]
Prior Inclusive Countries	-0.34	0.25	[-0.83 , 0.14]
Prior Exclusive Countries	-0.48*	0.24	[-0.96 , -0.01]

Note: Estimates are the difference-in-differences between treated and matched controls units three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations: † $p<0.10$ * $p<0.05$ ** $p<0.01$

Table A7. CIRIGHTS, WBL Index, Heterogeneous Effects in Matching, and Naïve Models

The table below shows results of CEDAW ratification on two broader measures of economic rights for women, as well as a model adding the heterogeneous effects into the matching process and a model removing the women's rights variables from the matching process. The CIRIGHTS model was ran with the same variables as the main model, with the exception of omitting the WBL's credit access variable and VDEM's women's civil liberties variables from the matching process. Additionally, the coding for the CIRIGHTS women's economic rights variable was collapsed from the original ordinal coding of 0 to 3 to a binary variable distinguishing lower (0 or 1) and higher (2 or 3) categories. Lastly, due to the temporal span of the CIRIGHTS data, the analysis and matching only takes place for the years 1981 – 2012. Estimates show that CEDAW results in a 10 percentage point increase in the probability that a country will go from being in one of the lower categories of women's economic rights to one of the higher categories of CIRIGHTS' women's rights three years after ratification. Qualitatively, this can be understood as country moving from having little to no laws or enforcement for women's economic rights, to having both formal laws guaranteeing women's economic rights and effective enforcement of these laws.

The second model estimates CEDAW's effect on an alternative measure of broad economic rights for women taken from the World Bank's Women Business and the Law index. The WBL analysis mirrored the main analysis with the exception of removing the "credit access" variable from the matching model since this variable goes into the WBL index measure. Similar to the CIRIGHTS analysis, the WBL analysis shows that CEDAW ratification accounts for a statistically significant increase in women's economic rights when comparing treated countries to their matched controls.

Lastly, the Heterogeneous effects and Base model estimates CEDAW's impact on the informal economy three years after ratification. In the heterogeneous effects model, indicator variables for high oil rents, large export-oriented manufacturing, and countries with high levels of gender inclusion are added to the matching process. In the base model, the women's rights variables (credit access and women's civil liberties) are omitted from the matching process. Both the heterogeneous effects and base model show CEDAW ratification accounts for a significant decrease in the size of the informal economy.

Model	Estimate	Std. Error	95% Conf. Intervals
CIRIGHTS Women's Econ Rights	0.10*	0.04	[0.01 , 0.20]
World Bank WBL Index	1.68**	0.50	[0.51 , 3.03]
Matching on Heterogeneous Effects	-0.36*	0.18	[-0.72 , -0.01]
Base Model	-0.39*	0.17	[-0.73 , -0.05]

Estimates are the difference-in-differences between treated and matched controls units three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations: † $p<0.10$ * $p<0.05$ ** $p<0.01$

Figure A5. Endogeneity Test: Do high levels of gender inclusion lead to CEDAW Ratification?

One possible endogeneity concern rests in the possibility that countries are selecting into CEDAW ratification due to previously high levels of gender inclusion and that these countries are also making attempts to reduce the size of the informal economy. While gender inclusion is controlled for in the matching model, I ran an additional difference-in-differences analysis to see whether those countries with high levels of inclusion for women are more likely to ratify CEDAW. To do this, I created a dummy treatment variable for those countries with pre-ratification gender inclusion scores half a standard deviation over the sample mean. The outcome variable is a dummy variable taking a value of one (1) for the year a country ratified CEDAW and every year after that. While the sample size is small for this additional analysis, the results show that previously high levels of gender inclusion are not driving CEDAW ratification. This should be expected given the near universal ratification status of CEDAW.

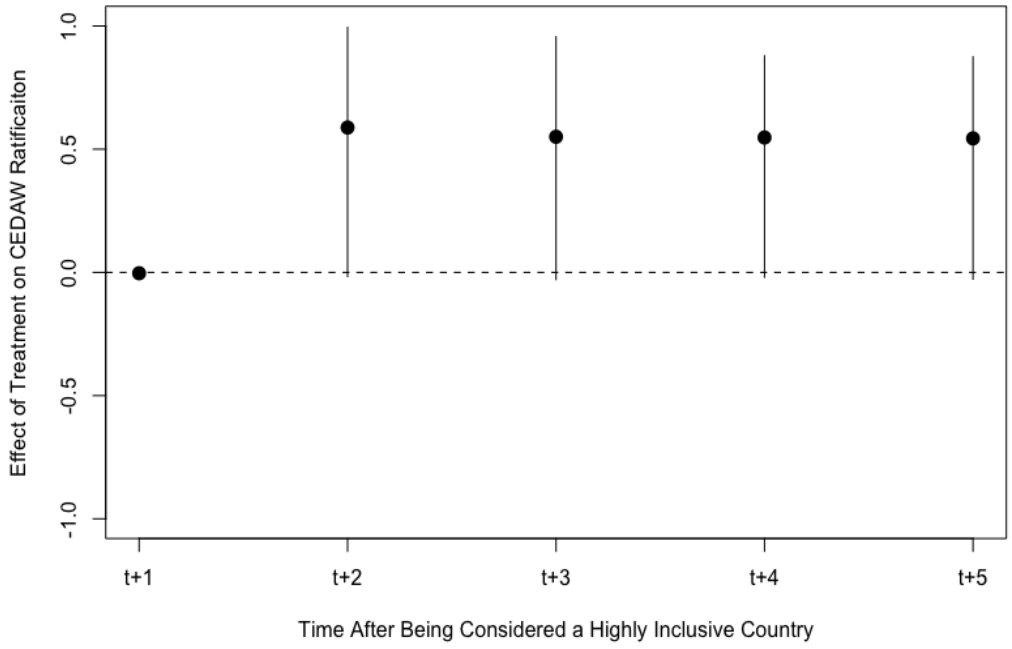


Figure A6. Endogeneity Test: Does having a large informal economy lead to CEDAW ratification?

Another possible endogeneity concern is the possibility that countries may be signing CEDAW to address the size of their informal economy. In this scenario, rather than CEDAW causing a decrease in informality, countries with large informal economies are choosing to ratify CEDAW in an effort to combat informality. To test for this possibility, I created a treatment variable for those countries with very large informal economies. Specifically, if the size of a country's informal economy was half a standard deviation over the sample mean in a given year, this variable takes a value of one (1) and zero (0) otherwise. From there I performed a matching and difference-in-differences analysis on the probability that a country will ratify CEDAW if they have a large informal economy. The results show that those countries with large levels of informal economy were not more likely to ratify CEDAW compared to those with medium-to-small informal economies. If anything, the first year after a country is coded as having a large informal economy shows a negative relationship with CEDAW ratification.

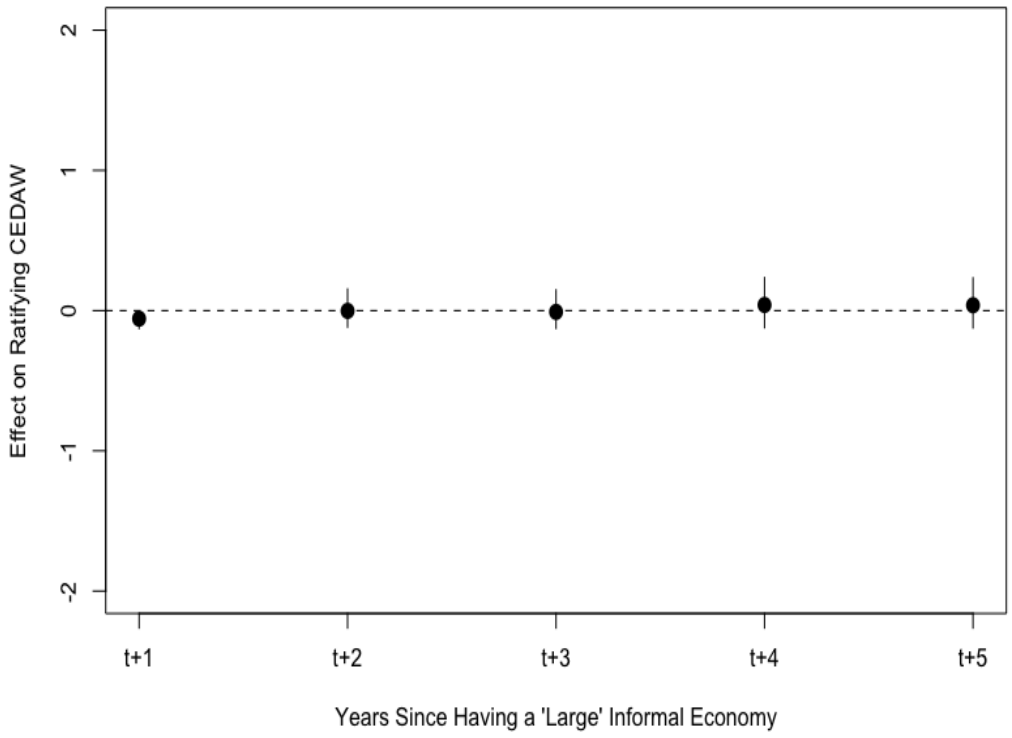


Table A8. Reform-Minded Governments and Treaty Bundling

An important alternative story to my argument is that the results found are not due to CEDAW ratification, but rather due to reform-minded governments aiming to improve women's rights once they come into power. This could take the form of enacting domestic legislation at the same time as a country ratifies CEDAW, causing the results I find. To test this possibility, 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 support the equal participation of women in the labor market and 0 otherwise. Then, I run a matching and difference-in-differences analysis using the reform party variable as a moderator to see if results are being driven by this subset of countries. This approach addresses the possibility of newly elected, reform minded governments coming into power with a desire to increase women's labor participation.

Additionally, there is also the possibility that countries are bundling multiple human rights treaties while ratifying CEDAW, thereby isolating CEDAW's effect on the informal economy hard to ascertain. This can be viewed as an extension of the reform-minded governments arguments, wherein countries are creating domestic changes on their own and happening to be ratifying multiple international treaties along the way. To test for this possibility, I performed an additional matching and diff-in-diff analysis looking at the subgroup of countries who ratify multiple human rights treaties at the same time they ratify CEDAW to see if this group is driving the results in the main analysis. As the table below shows, neither reform minded governments nor countries who are bundling multiple treaties with CEDAW see a reduction in informality.

Model	Estimate	Std. Error	95% Conf. Intervals
Reform-Minded Governments	0.64	0.49	[-0.27 , 1.65]
Non Reform-Minded Governments	-0.45*	0.18	[-0.80, -0.10]
Treaty Bundling Countries	-0.44	0.36	[-0.56 , 0.48]
Non Bundling Countries	-0.44*	0.20	[-0.85 , -0.04]

Estimates are the difference-in-differences between treated and matched controls units three years after CEDAW ratification. Standard errors are generated via bootstrapping with 10,000 iterations: † $p<0.10$ * $p<0.05$ ** $p<0.01$

Table A9. Economic Investment due to CEDAW Ratification

In the main text I show how CEDAW ratification sends out entirely different signals to IOs and NGOs compared to other human rights treaties, and that these alternative treaties do not lead to a reduction in the size of the informal economy. However, there is the possibility that ratifying CEDAW sends a signal out to potential investors that the ratifying country is a good place to business with. In this scenario, rather than CEDAW causing a decrease in the informal economy through the reduction of formal barriers to employment for women, CEDAW leads to economic growth and investment within a country. This investment, possibly in the form of FDI, ODA, increased trade flows, or an increase in per capita GDP, facilitates growth in the formal economy and a reduction in the informal economy. To test whether this alternative scenario is occurring, I performed additional matching and difference-in-differences analyses moving these economic variables to the left hand side of the equation. The table below shows that ratification has a positive, but insignificant effect on per capita GDP, trade flows, ODA, and FDI; giving greater credibility to the results found in the main text and alleviating concerns that economic investments due to CEDAW ratification are causing the changes we see in the informal economy.

Outcome	Estimate	Std. Error	95% Conf. Intervals
GDP per capita	0.03	0.03	[-0.03 , 0.10]
Trade Flows	0.01	0.03	[-0.05 , 0.08]
Official Development Assistance	0.04	0.10	[-0.16 , 0.23]
Foreign Direct investment	0.46	0.49	[-0.41 , 1.52]

Note: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01; Estimates shown are the difference-in-differences between treated and matched control groups three years after CEDAW ratification.

Table A10. Exact Matching on Middle Eastern Countries

Scholars have debated whether the lack of rights for women in certain regions of the world (i.e., the Middle East) are a product of Islam, Arab culture, or economic orientation due to oil dependence. In the main text, I built upon Ross (2008) by theorizing and showing how CEDAW ratification has heterogeneous effects for those countries highly dependent on oil compared to those not dependent on oil. However, the vigorous debate on this subject leaves open the possibility that it is Arab culture or Islam that is driving the results found, not oil dependence. Although not a perfect answer to this critique, I performed additional analyses for both the global sample and the oil dependent (independent) countries *exactly* matching on middle eastern countries. By exactly matching on middle eastern countries, this alleviates potentially confounding variables often associated with the middle east, such as the Islamic religion or Arab culture. As shown in the table below, results hold in both the global analysis and the subsample analysis on oil dependent (independent) countries.

Outcome	Estimate	Std. Error	95% Conf. Intervals
Global Sample	-0.36*	0.18	[-0.71 , -0.01]
Oil Dependence (High)	0.27	0.81	[-1.22 , 1.99]
Oil Dependence (Low)	-0.48*	0.18	[-0.84 , -0.12]

Note: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01; Estimates shown are the difference-in-differences between treated and control groups three years after CEDAW ratification.