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

Christopher Gahagan[†]

Abstract

What effects do international treaties have on domestic outcomes? Scholarly debate around this topic often hinges on a country's motivations to ratify. While these debates are important, many international agreements have downstream consequences that are often overlooked in the literature due to their peripheral role on 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). In particular, I argue CEDAW ratification plays a meaningful role in reducing the size of the informal economy by lowering formal barriers to women's employment. Through the use of matching within a difference-in-differences (DID) design for time-series cross-sectional (TSCS) data, I show countries who ratify CEDAW see a significant decrease in the size of the informal economy three years after ratification. These results hold under different matching methods, pre-treatment lag lengths, as well as multiple robustness checks and placebo tests. These findings have important implications for both countries and individuals, including increases to public goods provision and more equitable and sustainable development. Moreover, these findings also speak to scholars of international relations. By demonstrating important peripheral outcomes that are arguably not core to ratification decisions, I shed light on the hotly debated topic of the role international agreements have on domestic outcomes.

† PhD Candidate, Florida State University

Introduction

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 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 often 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 a country to ratify. By failing to account for these downstream effects, political scientists run the risk of overlooking the full scope that these treaties have on domestic outcomes.

Consider the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), one of the most ratified human rights treaties in the world. CEDAW's stated goal is the elimination of discrimination against, and the promotion of equal rights for, all women. In short, CEDAW's aim is to bind states to empower women and put them on an equal playing field with men. Previous research investigating CEDAW has found mixed outcomes, with results pointing to increases in political rights and moderate increases to 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 argue we may be misinterpreting the value CEDAW has on women's economic outcomes because of two reasons. First, restricting our attention to specific indicators while ignoring the downstream consequences and observable implications these agreements have leaves political scientists with an incomplete understanding of the broad effects CEDAW can have. Second, recent methodological advances in time-series cross-sectional (TSCS) analyses enables greater insight into CEDAW's effect on economic outcomes than previous research has allowed.

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 et al. 2021). Moreover, understanding the determinants of informal work is especially important for women's development. In many parts of the world, women are often underrepresented in the formal economy (World Bank 2022a), and overrepresented in the informal economy (Deléchat and Medina 2021). I contend that although most countries are joining CEDAW for a variety of reasons, its effects on informal employment are not core to ratification concerns. Nevertheless, CEDAW ratification plays a meaningful role in reducing the size of the informal economy. While CEDAW may reduce informality through more than one causal channel, I argue an important mechanism involves the reduction of legal barriers towards women's formal employment. The removal of these barriers enables women, many of whom

---

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

were previously forced to work informally, 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 effects 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 three years after ratification. Moreover, I show that CEDAW ratification is responsible for a positive and significant increase in women's legal ability to get a job, giving evidence towards the proposed mechanism of a reduction in formal barriers for women in the workforce. These results are hold under a variety of different robustness checks including different lag and lead lengths, alternative matching methods and matching covariates, as well multiple placebo tests.

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 is not the only beneficial impact of ratification. 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.).

The findings here 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 international agreements have on domestic outcomes. By demonstrating how these agreements

4

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 may 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, as well as an additional pathway to sustainable growth. Lastly, by using techniques to address model dependence and relaxing implausible unconfoundedness assumptions in TSCS data, I am able to draw stronger causal inference than previous research has allowed.

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 logical 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.

Previous work on human rights treaties calls this assumption into question. If screening effects were the only reason states chose 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 or capacity to improve their practices. This results in ratification acting as little more than window dressing, which gives the perception of human rights treaties being ineffectual.

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 has shown that CEDAW does in fact help improve many aspects of women's lives. Both Englehart and Miller (2014) as well as Hill (2010) find positive improvements towards women's political rights and moderate improvements to women's social rights due to CEDAW ratification. Moreover, others have found that CEDAW leads to increases in health outcomes such as improvement in maternal and neonatal mortality rates (Gevrek and Middleton 2016), female adult mortality rates (Smith-Cannoy et al. 2020), and female life expectancy (Tait et al. 2019).

Building on this research, I argue that in addition to increases in political, social, and health outcomes, CEDAW ratification results in a notable and significant impact on an often overlooked economic outcome: the size of the informal economy. In particular, I argue that CEDAW helps to reduce informality by compelling governments to eliminate legal barriers towards women's employment, enabling women to move out of the informal economy and into the formal sector. In addition to adding to a country's tax base (Georgieva 2021) and involving less precarious work (Deléchat and Medina 2021), research has shown that moving women into the formal labor force often generates positive normative outcomes such as boosting influence at the individual level resulting in more sway within the family (Beegle, Frankenberg, and Thomas 2001; Iversen and Rosenbluth 2006), at the societal level resulting in more egalitarian beliefs

about gender relations (Thornton, Alwin, and Camburn 1983) and at the economic level by creating dense networks that boost their economic importance, compelling governments to take their interests into account (Ross 2008).

CEDAW and the Informal Economy

The worldwide informal economy is surprisingly large, consisting of roughly 61% of the global workforce (Deléchat and Medina 2021), and can account for over 75% of gross domestic product (GDP) in some countries (Schneider and Enste 2000). High levels of informal economic activity can often result in many detrimental outcomes. In addition to the negative effects 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 information (Elgin and Oztunali 2012). Informal firms also tend to be both small and have low levels of productivity, frequently promoting the inefficient use of scarce resources, and encouraging the adoption of low-return technology and small scale productions (Elbahnasawy, Ellis, and Adom 2016). The end result of having a large informal economy acts as an obstacle to inclusive and sustainable growth, and sees 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 in 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 formal 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, however 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 size of the informal economy by addressing one aspect of the exclusion channel that leads to informal work – legal and economic barriers towards 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 results in negative economic outcomes, such as large gender gaps in labor force participation (Lagarde 2014), higher levels of employment in the informal sector (Farhan et al. 2016), as well as all around less favorable outcomes in the labor market (Hyland, Djankov, and Goldberg 2020). In many parts of the world, exclusionary policies often include official restrictions on women's employment or the permitted discrimination against women in the workforce. The result of such policies offers women fewer formal employment opportunities, relegating them to work in the informal sector to provide for themselves or their families. However, I argue CEDAW helps to address these exclusionary policies, 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

8

promising to submit national 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 strategies such as educational programs, public naming and shaming, or domestic judicial processes.

To see how international treaty obligations change domestic practices, consider Nepal, which ratified CEDAW in 1991 with zero reservations. As told by Pandey (2013), events in Nepal surrounding ratification focused on issues involving penal, succession, adoption, and divorce laws, as well socially and culturally determined gender norms. While 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 CEDAW's principles and provisions. This ignorance often resulted in discriminatory rulings against women such as in the Meera Dhungana case of 1994, whereby judges referenced social norms and value systems in their refusal to provide equal property rights to women (Pandey 2013).

Given the disconnect between Nepal's obligations under CEDAW and domestic legal outcomes, NGOs such as Pro Public worked to bring about both women's rights litigation, as well as legal education programs for those in the judiciary. These programs, in tandem with the legal challenges brought forth, 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 rights in a later case involving recruitment discrimination against Royal Nepal Airlines Corporation (Pandey 2013).[2]

Although anecdotal, the above scenario offers one example showing how these processes help governments fulfill their obligations under CEDAW and promote women's equality. Importantly, conversations in Nepal and many other countries surrounding CEDAW do not mention addressing the size of a country's informal economy when considering ratification. Rather, events such as systemic forms of violence against women (Mehra 2013), as well as discriminatory practices in inheritance (Hallward-Driemeier and Hasan 2012), adoption, and divorce laws (Pandey 2013) propelled domestic groups to want reform. Nevertheless, I contend these reforms resulted in downstream consequences that play a meaningful role in reducing the size of the informal economy.

While CEDAW's effect on the informal economy more than likely works through many different causal channels, I argue one key mechanism is reduced legal barriers to formal employment, such as those noted above in Nepal. The direct implication of this process generates more access to formal work for women, while providing fewer 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 often underrepresented in the formal economy and overrepresented in the informal economy, often due to official barriers to employment that relegate women to work informally. In contrast, 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 so, in addition to

---

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

CEDAW ratification lowering the size of the informal economy, we should see an increase in the

rate that women are allowed to obtain formal employment on an equal basis with men shortly

after ratification occurs. 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 ratification will lead to an increase in the rate of women allowed to seek formal

employment on an equal basis with men.

Heterogeneity in Treaty Impact on the Informal Sector

Hypothesis 1 intends to test the effect of CEDAW ratification on a global scale, however

there are plausible reasons that ratification might have heterogeneous effects on the size of the

informal economy in different countries for a variety of reasons. As mentioned, most people

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 in the workforce in every

country. Rather, we should expect that CEDAW ratification should be more pronounced in

different subgroups due to a variety of local conditions. For example, Ross (2008) argues that oil

rich countries often suffer from what he refers to as 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. Importantly, this wealth transforms the economy, resulting in movement away

from traded sectors that traditionally employ women (such as export-oriented manufacturing

sectors) and towards nontraded sectors that traditionally employ men (such as construction and services). This logic suggest that women may be less likely to participate in the labor force due to economic composition rather than formal exclusions. If this is the case, then we should expect CEDAW to have less of an effect on the informal economy for countries largely dependent on oil. Conversely, for those countries not dependent on oil exports, I argue we should expect CEDAW ratification to play a meaningful role in reducing informality. This leads to Hypotheses 3a and 3b regarding CEDAW's effect on the informal economy.

H3a: CEDAW ratification will have a minimal effect, if any, on the size of the informal economy for countries dependent on oil.

H3b: CEDAW ratification will have a negative effect on the size of the informal economy for countries not dependent on oil.

Additionally, I argue we should expect ratification to have heterogeneous effects on subgroups of countries with strong export-oriented manufacturing sectors. The reasoning here rests in the fact that in many parts of the world, manufacturing industries seek to employ women in occupations such as textiles, garments, plastics, and electronic goods (Ross 2008). Moreover, export industries by nature sell to a global market, which can result in quick growth and the production of a large number of jobs (Ross 2008). This means these industries can face labor demands that cannot be satisfied by men alone. With barriers in place, women may be forced to work informally in any number of sectors. However, once barriers are eliminated, countries with large export-oriented manufacturing sectors will be able to tap into this previously unavailable

labor resource, or more likely, incorporate previously informal women into the formal workforce. The end result will see a decrease in the overall size of the informal economy for these particular countries. On the other hand, for those countries with small export-oriented manufacturing industries, this opportunity for women may not be present. While CEDAW ratification should still result in a reduction of formal barriers to work for women in this group of countries, the effect may not be as pronounced due to a lack of opportunities for women in the workforce. 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.

H4a: CEDAW ratification will have a negative effect on the size of the informal economy for countries that have large export-oriented manufacturing sectors.

H4b: CEDAW ratification will have a minimal effect on the size of the informal economy for countries that have medium-to-small export-oriented manufacturing sectors.

Lastly, I argue we should expect ratification to have heterogenous effects based on how much "room-to-move" a country has. 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 effect on the size of the informal economy, given 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 should have ample "room-to-move," leading to a decrease in the size of their informal economy after ratification. This "room-to-move" argument leads to Hypotheses 5a and 5b regarding CEDAW's effect on the size of the informal economy conditional on previous levels of inclusion or exclusion towards women.

H5a: CEDAW ratification will have a minimal effect, if any, on the size of the informal economy for countries who exhibit high levels of inclusion towards women prior to ratification.

H5b: CEDAW ratification will result in a decrease in the size of the informal economy for countries that exhibit exclusionary policies towards women prior to ratification.

Research Design

To test CEDAW's effect on the informal economy, I employ matching and a difference-in-differences analyses on a time-series cross-sectional sample of 146 countries from 1978-2012, with the unit of observation being a country-year. To account for possible selection effects that could threaten the credibility of treatment assignment, I collect numerous potentially confounding covariates during the matching process that might affect both treatment and outcome variables. In other words, countries that ratify CEDAW are matched with similar countries that did not, or had not yet ratified, on confounding covariates and outcome histories. After matching, I perform a difference-in-difference on the change in the size of the informal

economy for ratifying country$_i$, compared to their matched controls, up to three years after ratification.

Dependent Variable

The outcome of interest is the size of a country's informal economy as a percent to GDP. Specifically, I use the measure developed by Elgin and Oztunali (2012)[3] and gathered from Blanton, Early, and Peksen (2018). Unlike regional survey data used to estimate informality,[4] cross country informality data often uses complex statistical models to determine the size of a country's informal economy. In particular, the Elgin and Oztunali data is generated using 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 in a given country-year.[5] 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.

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 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

---

[3] The DGE model used by Elgin and Oztunali (2012), along with the MIMIC model (Schneider and Enste 2000) are often employed by various international organizations such as the World Bank and the IMF when studying informal economies.

[4] See Cano-Urbina (2016).

[5] See Elgin and Oztunali (2012) for a detailed description of the model. The data used here ends in 2012. Only three countries ratified CEDAW after 2012 (Nauru, Palestine, and South Sudan).

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).[6] An additional 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 the CEDAW's effect on the size of the informal economy, I incorporated Hill and Watson's (2019) coding of CEDAW ratification for my treatment variable. In this variable, countries take a value of 1 the year CEDAW is ratified (and every year after) and 0 otherwise. Substantively, I expect the results of ratification shouldn't happen immediately due to the often slow moving nature of policy change, as well as time needed for these changes to permeate through society. Given this, I opt for a post-treatment window of three years to observe the

---

[6] 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, Djankov, and Goldberg 2020).

average treatment effect on the treated (ATT) of CEDAW ratification on the size of a country's informal economy.[7] In particular, 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

An important confounding covariate in both the study of informality and human rights is regime type, with previous researchers finding significant effects pertaining to both economic and human rights outcomes (Hill and Watson 2019; Richards and Gelleny 2007; Teobaldelli and Schneider 2013; Vreeland 2008). Many democratic norms purport to have, at minimum, rough equality among citizens and therefore more egalitarian and inclusive polices. Therefore, matching on regime-type characteristics enables more accurate comparisons on both the treatment and the outcome variables needed to causally identify CEDAW's effect on the informal economy. To address this, I matched and balanced countries on the Polity 2 index from the Polity V database developed by Marshall and Gurr (2022), which spans from -10 (most autocratic) to +10 (most democratic).

Additionally, the level of economic development within countries such as GDP per capita, Foreign Direct Investment (FDI), or Official Development Assistance (ODA) could plausibly influence respect for human rights, levels of informality, or CEDAW ratification (Deléchat and Medina 2021; Dell'Anno 2010; Hill 2010; Richards and Gelleny 2007). To account for these possible confounders, I matched countries on a variety of economic indicators

---

[7] I estimate the ATT because of both substantive interest and due to the data generating process. Because this is a quasi-experiment, I do not have the ability to force treated and control countries into two separate groups, such as in randomized control trials. More importantly, I argue there is a substantive interest in the effects of treatment for countries that actually experience the treatment, which in this case changes resulting from CEDAW ratification.

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 (% to GDP), Inflation (annual %), Unemployment (% total labor force, ILO estimate), Foreign Direct Investment (net inflows, % to GDP), net ODA received per capita (logged), and female labor force participation rate (% of population, ILO estimate).[8]

Furthermore, previous research has found that violent conflict can affect both human rights and informality (Blanton, Early, and Peksen 2018; Elbahnasawy, Ellis, and Adom 2016; Hafner-Burton and Tsutsui 2007; Hill 2010) given conflict can lead to more repression by governments and economic instability. To make sure countries are matched and weighted on this potential confounder, I followed Blanton, Early, and Peksen (2018) and incorporated their conflict intensity indicator originating from the UCDP/PRIO Armed Conflict Dataset (Gleditsch et al. 2002). This variable ranges from 0 to 2, with 0 denoting that a country did not experience any major internal conflict in a given year, 1 for conflicts in which the yearly death count ranges from 25 to 1000, and 2 for wars in which the annual total battle-related death count is above 1000 (Blanton, Early, and Peksen 2018).

In addition to differences in political and economic 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), as well as 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

---

[8] 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.

whether women have the ability to make meaningful decisions in key areas of their lives, such as freedom of domestic movement, freedom from forced labor, property rights, and access to justice (Coppedge et al. 2020), with scores ranging on an interval from 0 (low) to 1 (high). VDEM's Civil Society Index measures the robustness of a country's civil society and is measured on an interval scale similar to the WCL index. On the other hand, the credit access variable from the WBL index is a binary indicator measuring if discrimination by creditors when conducting financial transactions, entrepreneurial activities, receiving financial assistance, or accessing goods and financial services is legally prohibited based on gender.[9]

Lastly, a potentially confounding scenario may occur if countries are bundling multiple human rights treaties at once, thereby isolating CEDAW's effect on the informal economy hard to ascertain. Although a limited amount of bundling is occurring in the sample, to address this possibility, I created a binary variable that takes the value of one (1) for those countries that ratified CEDAW and any other major human rights treaty within the same year and zero (0) otherwise. From there, I incorporated the bundling variable into the matching method to control for any confounding relationships.[10]

Identification Strategy

Previous research has shown that estimating outcomes for countries who ratify international treaties compared to countries who never ratify can lead to biased results, given domestic level characteristics can influence a state's decision to ratify (Hill 2010). Fortunately,

---

[9] While I believe this is the most appropriate specification, results are similar if these variables are dropped from the matching model.

[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.

the matching and difference-in-differences method utilized here sidesteps many of the econometric problems inherent in previous approaches while also improving the validity of causal inference by reducing model dependence. To estimate the ATT, I utilized Covariate Balancing Propensity Score Weighting (CBPS) and a three-year lag of the dependent variable and all covariates to create matches between each treated country and weighted control countries. The matching process resulted in 122 successful matches with an average matched set size of 46 control units per treated unit, with weights determined via the CBPS algorithm.

   After matching, I perform a difference-in-differences[11] 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.[12] 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 method is preferable given that it helps address specific concerns about endogeneity and aids causal inference since randomization is not possible. Moreover, 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.[13]

The Parallel Trends Assumption

---

[11] I performed the analyses via the R package `PanelMatch` developed by Imai, Kim, and Wang (2021).

[12] Matching on confounding covariates, a lagged dependent variable, and utilizing bock bootstrapping should address both autocorrelation and endogeneity concerns. However, in later sections I perform robustness checks to address these concerns as well. A table showing the exact values of covariate balance before and after refinement can be found in the appendix.

[13] 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.

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 under sequential ignorability. 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.

Although there is no way to observe the counterfactual needed to fully test the parallel trends assumption in TSCS data, using the refined matched sets we can visually examine whether trends between groups appear to be parallel, as shown in Figure 1 below. Specifically, the x-axis shows the time (in years) before treatment onset, 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 (Imai, Kim, and Wang 2021). Large differences in standard deviations would imply that treated and control units are not parallel prior to treatment onset (i.e., if the line showing the difference in Figure 1 was around 1 or 2 standard deviations). However, the difference between treated and control units in the analysis is small, with values staying around 0.08 standard deviations. While the chance for missing observables 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.
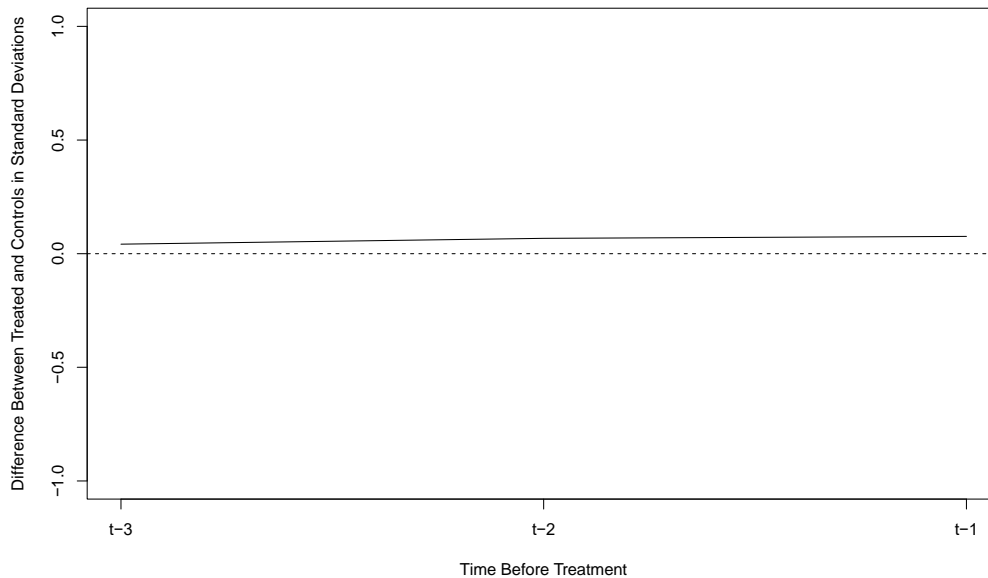
Figure 1. *Parallel Trends Plot Showing Minimal Difference Between Treated and Control Groups*

Testing CEDAW's Heterogeneous Effects

To test Hypotheses 3-5, I created dummy variables to perform subgroup analyses regarding a country's reliance on oil, the size of a country's export oriented manufacturing sector, or prior levels of gender inclusion. As a reminder, Hypotheses 3a and 3b state that ratification will result in a significant reduction in the size of the informal economy for countries not dependent on oil, while having a diminished effect on the subset of countries who are dependent on oil. To test this subgroup, 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.

Hypotheses 4a and 4b state that ratification will result in a significant reduction in the size of the informal economy for countries that have large export-oriented manufacturing sectors,

22

and a reduced effect, if any, on countries with small export-oriented manufacturing sectors. For this subgroup, 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, 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 5a and 5b argues that we should expect CEDAW ratification to have heterogeneous effects depending on how much room-to-move a country has. For those countries with previously high levels of gender inclusion, CEDAW ratification should have a minimal impact, if any, on the size of the informal economy. This is due to the fact that many of the barriers that are meant to prevent women from formal employment have already been remedied. In other words, we should expect "ceiling effects" to occur. Conversely, the subset of countries that previously excluded women have ample room-to-move and should see a decrease in the size of the informal economy after ratification as these previously high barriers are eliminated. 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.[14]

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 2 shows that for those countries who ratify CEDAW, there is a significant reduction in the size of the informal economy compared to control countries, giving support to Hypothesis 1. [15] These estimates are the difference between treated countries minus their matched control countries, giving us a reasonable counterfactual comparison of CEDAW's effect on informality. By the end of the post-treatment window for the global sample, ratification accounts for a decrease in informality by just under a half of a percent of GDP.[16]

---

[14] As opposed to VDEM's original coding, gender inclusion is coded so that higher values represent more inclusion rather than exclusion. In other words, a country that has a score of 0.982 (e.g., Denmark in 2012) has much more gender inclusion than a country with a score of 0.026 (e.g., Saudi Arabia in 1990).
[15] A naïve model omitting the women's rights variables in the matching process generated similar results to the main analysis and can be found in the appendix.
[16] Specifically, CEDAW ratification is estimated to reduce informality by 0.42% of GDP, significant at the .05 level.
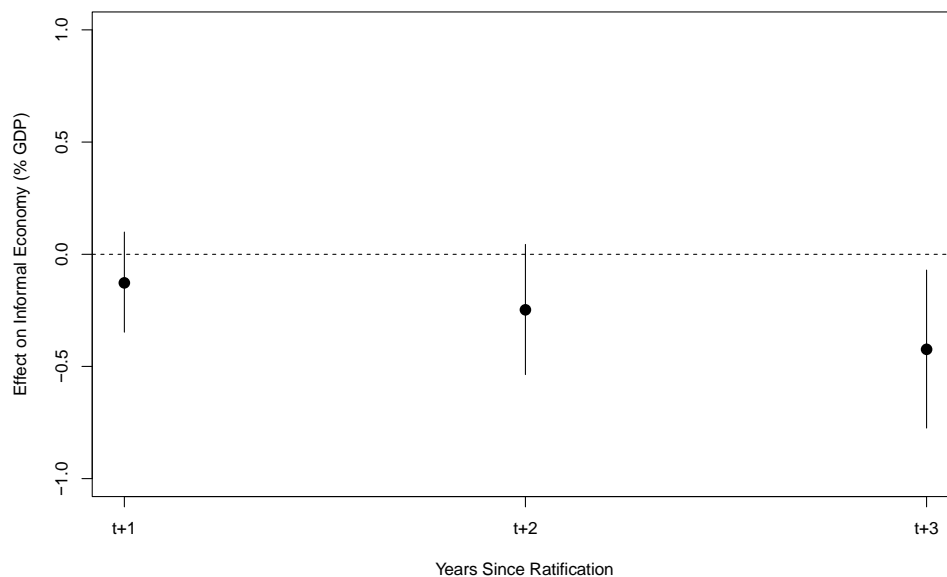
Figure 2. *Estimated Effect of CEDAW Ratification on Informal Economic Activity Over Time*

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% 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.[17] 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 above –

many in the judiciary were unaware of CEDAW's provisions and failed to enforce their

---

[17] Author's own calculations.

25

obligations immediately. However, we do see sizable decreases in the informal economy in many other developing 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 developing countries in these regions started out with larger informal economies compared to some of their wealthier counterparts. However, we also see comparably larger reductions in the informal sector in the three years after CEDAW ratification. For example, when looking at OECD member countries,[18] 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 argued above, while most countries are ratifying CEDAW for a number of reasons including reforms to penal and family laws, the potential effects on informal employment are more 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, peripheral outcomes around international treaties. Recognizing the downstream consequences of treaties like CEDAW furthers our understanding of the role international agreements have on domestic outcomes.

---

[18] In the sample, OECD countries were considered as those members belonging to the organization prior to the United Nation's General Assembly's adoption of CEDAW in 1979.

Testing the Mechanism and CEDAW's effect on Broader Rights for Women

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 in 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 answer this, I performed an additional matching and difference-in-differences analysis testing CEDAW's effect on women obtaining work on an equal basis with men. Figure 3 shows that by the end of the three year post treatment window, countries who ratified CEDAW experienced nearly a six percent increase in the probability that women can get a job in the same way as men, significant at the .05 level. The elimination of formal barriers after ratification offers support for Hypothesis 2, and evidence of one important channel by which CEDAW plays a role in reducing informality.
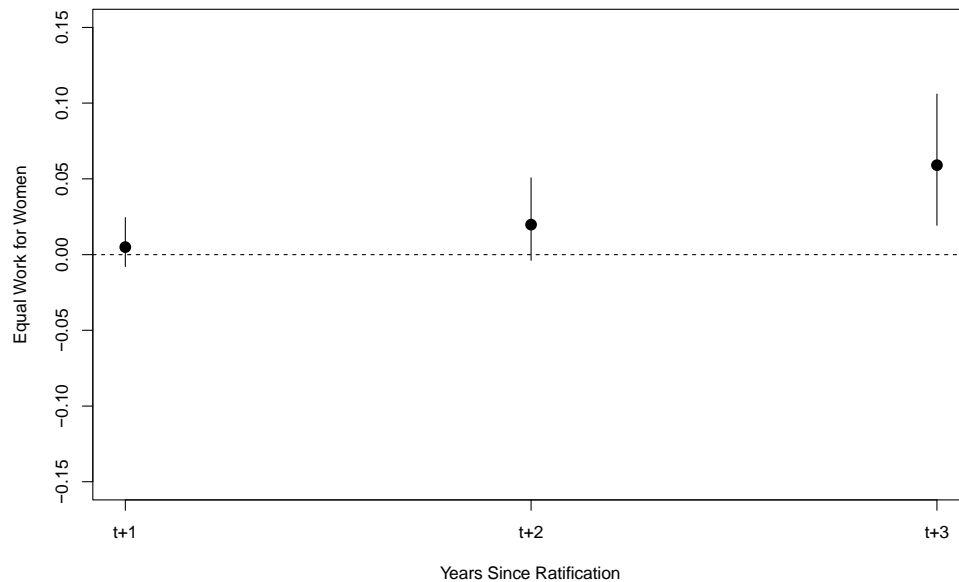
Figure 3. *CEDAW's Effect on Women Obtaining a Job on an Equal Basis with Men*

The results above offer evidence that CEDAW ratification improves women's ability to get a job on an equal basis with men, which in turn can act as a catalyst for women to move out of the informal economy. Yet, a natural question arises whether ratification generates improvements on a broader set of economic rights for women.

This is by no means a new question. Previous work by Englehart and Miller (2014) and Hill (2010) found CEDAW ratification leads to improvements in political and social rights for women, yet no discernable effect on women's economic rights. Both Englehart and Miller (2014) and Hill (2010) investigate CEDAW's effect on an indicator for Women's Economic Rights from the CIRI human rights data set (Cingranelli and Richards 2010). This indicator measures both the extensiveness of laws pertaining to women's economic rights, as well as enforcement of these laws in areas such as equal pay for equal work, free choice of profession, the right to gainful employment, equality in hiring and promotions, maternity leave, as well as

many other internationally recognized economic rights (Mark et al. 2023). Although the World Bank's indicator for women's ability to get a job in the same way as men focuses on a specific, and possibly subjective, aspect of women's rights, the Women's Economic Rights indicator from Cingranelli and Richards (2010) encompasses a much broader set economic rights.

While both Englehart and Miller (2014) and Hill (2010) provided invaluable insights into the effects of CEDAW ratification, recent advances in TSCS methodology has given political scientists additional tools to evaluate CEDAW's role on women's economic rights by addressing hard to satisfy unconfoundedness assumptions, endogeneity concerns, and model dependence. To investigate CEDAW's role on these broader economic rights, I incorporated CIRIGHTS' Women's Economic Rights indicator (Mark et al. 2023) in an additional matching and difference-in-differences analysis. Specifically, I created a binary variable to test the probability that CEDAW ratification triggers movement from lower categories (Categories 0 or 1) of CIRIGHTS' Women's Economic Rights (Wecon) indicator to higher categories (Categories 2 or 3). This analysis mirrored the analyses above in terms of matching methods and covariates, with a few exceptions. First, the dependent variable consisted of the newly created binary variable for CIRIGHTS' Women's Economic Rights, rather than the size of the informal economy. Second, I omitted the WBL's credit access variable and VDEM's women's civil liberties variable from the matching method as these two variables capture a lot of what CIRIGHT'S Wecon indicator is measuring. Lastly, because the CIRIGHTS data does not start until 1981, the temporal span of the study is therefore limited to the years 1981 – 2012.

Figure 4 below shows the results of CEDAW ratification on a broader set of women's economic rights. Looking at CEDAW's effect on CIRIGHTS' Wecon indicator, the difference-in-differences analysis generates a point estimate of 0.10, significant at the .05 level. A

29

straightforward interpretation for this result can be understood as CEDAW ratification accounts for an increase in the probability that a country will move from one of the lower categories (1 or 2) to one of the higher categories (2 or 3) of around 10 percentage points. It is important to note that this movement represents a qualitatively important shift for women's economic rights. The CIRIGHTS coding scheme makes important cut points between the different categories in both government enforcement and toleration of discrimination towards women. Countries who fall into the lower categories often have few laws, if any, pertaining to economic rights for women. Moreover, what laws do exist are often not enforced by the government while moderate to systematic levels of discrimination towards women exist (Mark et al. 2023). Conversely, for countries in the higher categories, some or nearly all of women's economic rights are guaranteed by law and, importantly, governments enforce these laws effectively (Mark et al. 2023). These results give additional evidence that CEDAW ratification results in noticeable and positive changes in women's lives, including greater economic opportunities, as well as more inclusive and sustainable development.[19]

---

[19] An additional analysis utilizing the WBL's broad measure on economic rights for women returned similar results as the CIRIGHTS analysis and can be found in the appendix.
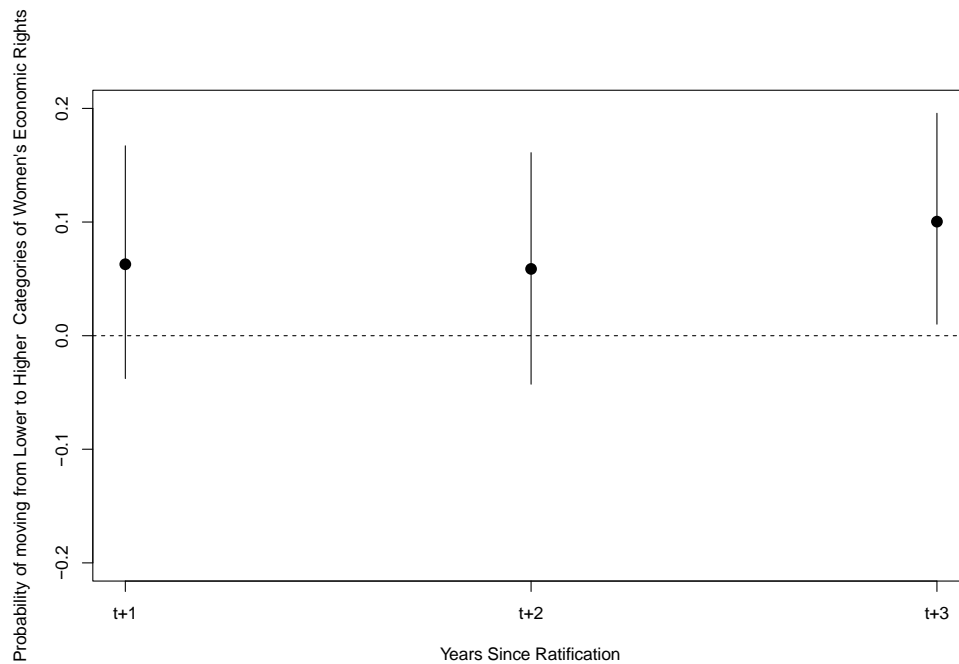
Figure 4. CEDAW's Effect on CIRIGHTS' Women's Economic Rights

CEDAW's Heterogeneous Effects

While Hypotheses 1 and 2 tested CEDAW's effect on a global sample, I argued above that we should expect heterogeneous effects from ratification for different subsample populations. As a reminder, I argue CEDAW helps to solve problems in the "exclusion" channel for informality. However, formal exclusionary restrictions may not be the main constraint on women in the workforce for all countries. In particular, I argue that we should expect treatment effects from CEDAW to "turn on" for a specific set of countries, while having a minimal effect for other sets of countries.

Table 1 below offers support for the heterogenous effects CEDAW has on the size of the informal economy as I argue in Hypotheses 3-5. I matched and weighted countries on the same covariates as in the global results above, while incorporating moderating dummy variables into the difference-in-differences analysis to show heterogeneity in treaty impact. The result of this

process created two sets of subsample analyses per hypothesis. As a reminder, Hypotheses 3a and 3b predicts that ratification will have a minimal effect, if any, on the size of the informal economy for oil dependent countries (H3a) and a negative and significant effect for countries not dependent on oil (H3b). The results in Table 1 bear out these predictions. For those countries not dependent on oil, the decrease in informality is both significant and larger than the global sample, with an estimated decrease of 0.52% of GDP. However, for the subset of countries highly dependent on oil rents, the coefficient is not precisely estimated and is much smaller in magnitude than both the global sample and for those countries not dependent on oil. Taken together, the results for Hypotheses 3a and 3b suggests a modern form of Dutch Disease may be occurring and gives evidence that while CEDAW addresses many legal obstacles towards women working formally, there may be other economic factors at work which CEDAW is unable to remedy.

Continuing with Table 1, Hypotheses 4a and 4b argues that countries with large export-oriented manufacturing sectors will see a significant decrease in informality (H4a), while those countries with small export-oriented manufacturing sectors will see a minimal effect, if any (H4b). The results below support both of these hypotheses. CEDAW ratification results in a negative but insignificant effect on the size of the informal economy for the subset of countries with small export-oriented manufacturing sectors. In contrast, for the subset of countries with large export-oriented manufacturing sectors, ratification results in a significant reduction on the size of the informal economy. In fact, countries high in manufacturing exports see the largest decline in informality in the sample, with a decrease of 1% of GDP.[20] These results align with my argument that once CEDAW helps to eliminate formal barriers to work, countries with large

---

[20] Significant at the .01 level.

export-oriented manufacturing sectors 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.

Lastly, Table 1 shows the results from the "room-to-move" hypotheses. As a reminder, Hypothesis 5a argues that CEDAW ratification should have a minimal effect on the size of the informal economy in countries with high levels of gender inclusivity *prior* to ratification due to possible ceiling effects. As I mentioned above, the reasoning here rests in that the exclusionary barriers CEDAW is meant to address are already remedied, therefore creating a ceiling effect in these countries. Conversely, Hypothesis 5b argues that CEDAW ratification should result in a significant decrease in the size of the informal economy for countries who exhibited more exclusionary policies towards women *prior* to ratification. These countries have the most room-to-move when it comes to policy changes that improve women's lives. I argue we should expect ratification to have a stronger impact on informality in these countries once exclusions towards women are eliminated. As Table 1 shows, I find support for both Hypotheses 5a and 5b. CEDAW ratification results in a negative effect on the size of the informal economy for prior inclusive countries, however the estimate is imprecise and not significant at conventional levels. However, for the subset of countries that were more exclusive towards women prior to CEDAW, ratification results in a significant decrease in the size of the informal economy, with an estimated decrease in the size of the informal economy by 0.48% of GDP, significant at the .05 level.

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

Sample	T+3 Estimate	Std. Error	95% Conf. Intervals
Global Estimate	-0.42*	0.18	[-0.77 , -0.07]
Oil Dependence (High)	0.02	0.60	[-1.20 , 1.16]
Oil Dependence (Low)	-0.52**	0.19	[-0.90 , -0.15]
Export Manufacturing (High)	-1.00**	0.33	[-1.72 , -0.40]
Export Manufacturing (Low)	-0.11	0.29	[-0.67 , 0.48]
Prior Inclusive Countries	-0.29	0.27	[-0.80 , 0.25]
Prior Exclusive Countries	-0.48*	0.21	[-0.91 , -0.06]

Note: Bootstrapped std. errors with 10,000 iterations; † $p<0.10$ * $p<0.05$ ** $p<0.01$

In summary, the results above offer supporting evidence for Hypotheses 1 through 5. 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 reliance on oil rents, size of export-oriented manufacturing industries, and prior levels of exclusion towards women. Additionally, I find support for my proposed mechanism that CEDAW's effect on the informal economy works by eliminating legal barriers to formal work for women.

One caveat to this study is the lack of data for the time period of the sample on informal economic activity by gender. [21] However, I contend that the results are consistent with my argument for two reasons. First, it seems unlikely that a global treaty protecting the rights of women would result in men leaving the informal sector, and thus contributing to the overall decrease in informal economic activity. Given that CEDAW specifically lays out protections for women, men who work informally are might be doing so not because of reasons in the

---

[21] Country-level estimates on informal employment by gender from reputable organizations such as the ILO and OECD are not only scarce, but suffer from a lack of historical data, with estimates starting in the mid-2000s, well after most countries had ratified CEDAW.

"exclusion channel", but rather reasons related to the "exit channel", such as avoiding high tax burdens or market regulations. Secondly, I both theorize and show where heterogeneous effects of ratification should exist. Factors such as different economic orientations brought on by oil dependence, the size of a country's export-oriented manufacturing industries, as well as a country's previous levels of exclusion towards women result in varying degrees through 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 here.

Robustness Checks

While the analyses above offer evidence that CEDAW ratification plays an important role in lowering informal economic activity, it is prudent to test threats to inference. Therefore, I performed a variety of robustness checks to see if the results found above hold. In the appendix, I show that the results for the global analysis, as well as CEDAW's heterogeneous effects, hold under different lag and lead lengths[22], as well as alternative matching methods such as propensity score weighting and Mahalanobis distance matching. Additionally, I conduct multiple analyses to address endogeneity concerns, such as whether high levels of informality or high levels of gender inclusion leads to CEDAW ratification. The results for both endogeneity tests are insignificant, giving greater confidence in the findings above and alleviating potential concerns that high levels of informality or gender inclusion are causing countries to ratify CEDAW. Moreover, I also show in the appendix an additional analysis adding the heterogeneous treatment variables from above into the matching process. Although slightly smaller in magnitude, the

---

[22] With one exception, inclusive countries show a significant decrease in year t+5.

results show CEDAW accounts for a decrease in the size of the informal economy by roughly

0.36% of GDP, significant at the .05 level. Lastly, I show in the appendix an analysis testing

whether CEDAW's effect on informal economies is being driven by those countries who are

bundling multiple treaties at the same time. Estimates show that CEDAW ratification has an

insignificant effect on the size of the informal economy for the subset of countries who ratify

multiple human rights treaties at the same time, adding more confidence in the results found

above.

Placebo Tests

Advancing Ratification Timing

One potential threat to the results I find is that instead of CEDAW reducing official

barriers towards women in the workplace, ratification is simply coinciding with other concurrent

events aimed at expanding women's economic rights. To address this concern, I conducted a

placebo test on the data wherein I advanced CEDAW ratification by two years. In other words, if

a country ratified CEDAW in 1990, this placebo test shows the effect on the informal economy if

we pretend ratification happened in 1988. The goal here is to alleviate potential concerns by

showing that a treatment effect does not exist prior to the true ratification date. Similar to the

previous analyses, all units were matched and balanced using CBPS weighting and a three year

lag. As seen in Figure 5 below, the results from the placebo test generates estimates that are

statistically indistinguishable from zero, giving further confidence to my argument regarding

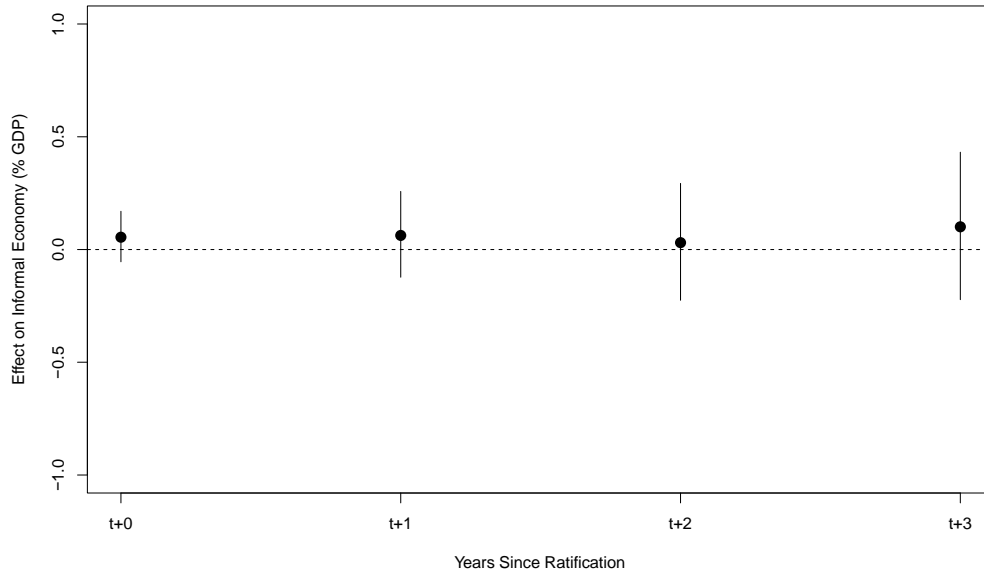CEDAW's role in reducing informality.

Figure 5. *Advancing CEDAW Ratification by Two Years*

Alternative Human Rights Treaties

Another threat to inference 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 human rights treaties may act as a signaling device to the international

community. The logic here rests in the idea that by ratifying popular treaties, countries signal to

potential investors that they are a good place to do business with. Once a country sends out this

signal, different forms of investment enter the country and create new economic opportunities,

resulting in a decrease in the informal economy.

To investigate whether ratifying any international human rights treaty causes a reduction

in the informal economy, rather than CEDAW specifically, I performed an additional placebo

test using ratification data for the Convention Against Torture (CAT). Specifically, I matched

countries on the same covariates as the main analysis using CBPS weighting[23] and a three-year

lag while replacing the CEDAW treatment variable with an indicator for CAT ratification taken

from Ryckman (2016). Figure 6 below shows the estimated effect of CAT ratification on the size

of the informal economy is statistically indistinguishable from zero. This is exactly what we

would expect to see given a placebo test of this nature. CEDAW and CAT send out entirely

different signals to both domestic and international audiences, and we should not expect one to

have the same effect as the other, especially on the size of the informal economy. These results

offer further evidence to my argument that it is CEDAW ratification specifically, rather than

ratification of any human rights treaty, that is causing the reduction we see in the size of the
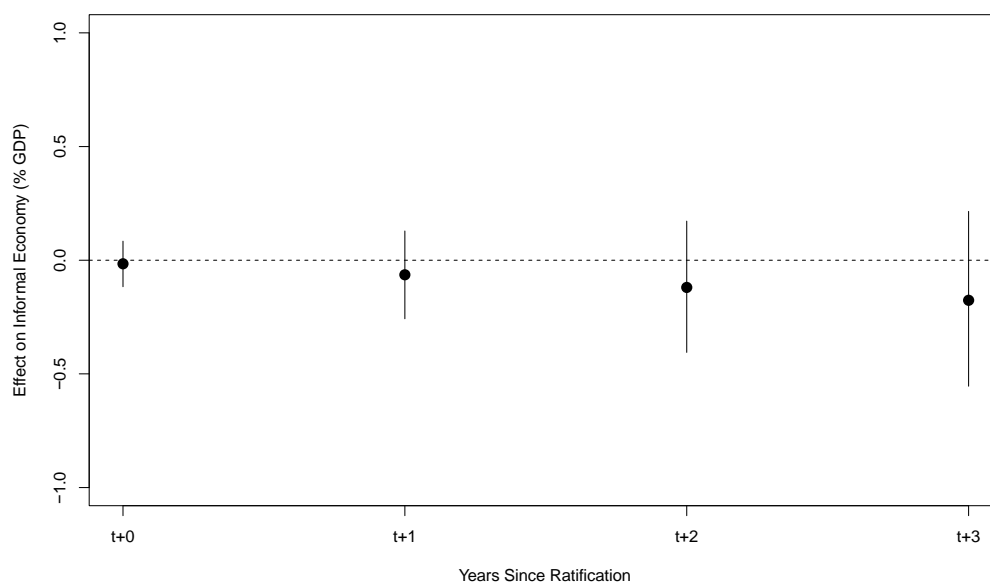
informal economy.

Figure 6. *Estimated Effect of Ratification of the Convention Against Torture on Informal Economic Activity*

---

[23] A parallel trends plot for the CAT analysis can be found in the Appendix.

Conclusion

What effects international treaties have on domestic outcomes has, and will continue to be, a hotly debated topic. Yet, regardless of where one falls on this debate, these treaties often have 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 how ratification results in a significant reduction in the size of the informal economy by nearly half a percent of GDP. Furthermore, I offer evidence of one potential mechanism by which CEDAW works through – the reduction of legal barriers to employment for women. Moreover, I also offer evidence of CEDAW's role in improving a broad set of economic rights for women. Utilizing CIRIGHTS data, I show that CEDAW ratification increases the probability of a 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.

Reducing informality results in additional tax revenue that can help fund often 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 up to 94 percent (Malta et al. 2021). Given the disproportionate number of women working informally on a global scale, understanding the determinants of informal work is critical to goals of sustainable development and equitable inclusion.

Additionally, I show the heterogeneous effects CEDAW has on women's informal employment due to factors such as reliance on oil rents, manufacturing exports, and prior levels of inclusivity. Ratification was shown to decrease the size of the informal economy in countries with low oil dependence, countries with a large export manufacturing sector, and in countries with high levels of exclusion towards women prior to ratification.

Future work could test the downstream effects of other international treaties, as well as other mechanisms by which CEDAW works through. Previous work has argued that formal laws can change local customs in favor of marginalized groups (Aldashev et al. 2012). When international agreements such as CEDAW result in equitable changes to domestic laws, local attitudes and customs towards women may also change for the better. In addition to formal legal barriers, these changes in customs may lower societal or cultural barriers to equality that women face on a daily basis.

References

Aldashev, Gani, Imane Chaara, Jean-Philippe Platteau, and Zaki Wahhaj. 2012. "Using the Law to Change the Custom." *Journal of Development Economics* 97(2): 182–200. doi:10.1016/j.jdeveco.2011.03.001.

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

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

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

Cano-Urbina, Javier. 2016. "INFORMAL LABOR MARKETS AND ON-THE-JOB TRAINING: EVIDENCE FROM WAGE DATA." *Economic Inquiry* 54(1): 25–43. doi:10.1111/ecin.12279.

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

Cingranelli, David, and David Richards. 2010. "The Cingranelli and Richards (CIRI) Human Rights Data Project." *Human Rights Quarterly* 32(2): 401–24.

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, Kyle M. Marquardt, Juraj Medzihorsky, et al. 2020. "Methodology V10." *SSRN Electronic Journal.* doi:10.2139/ssrn.3557904.

Deléchat, Corinne C., and Leandro Medina. 2021. *The Global Informal Workforce: Priorities for Inclusive Growth.* Washington, DC, USA: International Monetary Fund, Publications Services.

Dell'Anno, Roberto. 2010. "Institutions and Human Development in the Latin American Informal Economy." *Constitutional Political Economy* 21(3): 207–30. doi:10.1007/s10602-009-9079-3.

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, 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. doi:10.1017/S0020818300033427.

Elbahnasawy, Nasr G., Michael A. Ellis, and Assandé Désiré Adom. 2016. "Political Instability and the Informal Economy." *World Development* 85: 31–42. doi:10.1016/j.worlddev.2016.04.009.

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

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

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

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

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

Georgieva, Kristalina. 2021. "Foreword." In *The Global Informal Workforce: Priorities for Inclusive Growth*, Washington, DC, USA: International Monetary Fund, Publications Services.

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

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

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

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

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

Hallward-Driemeier, Mary, and Tazeen Hasan. 2012. *Empowering Women: Legal Rights and Economic Opportunities in Africa*. The World Bank. doi: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): 1161–74. doi:10.1017/S0022381610000599.

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

Hoffman, Steven J., Prativa Baral, Susan Rogers Van Katwyk, Lathika Sritharan, Matthew Hughsam, Harkanwal Randhawa, Gigi Lin, et al. 2022. "International Treaties Have Mostly Failed to Produce Their Intended Effects." *Proceedings of the National Academy of Sciences* 119(32): e2122854119. doi:10.1073/pnas.2122854119.

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

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

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

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

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

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

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, 188:217.

Margalit, Yotam. 2013. "Explaining Social Policy Preferences: Evidence from the Great Recession." *American Political Science Review* 107(1): 80–103. doi:10.1017/S0003055412000603.

Mark, Skip, David Cingranelli, Mikhail Filippov, and David Richards. 2023. "The CIRIGHTS Data Project Scoring Manual V1.25.22.11." *SSRN Electronic Journal*. doi:10.2139/ssrn.4625036.

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, 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, 410–29.

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

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

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

Ryckman, Kirssa Cline. 2016. "Ratification as Accommodation? Domestic Dissent and Human Rights Treaties." *Journal of Peace Research* 53(4): 582–96. doi:10.1177/0022343316630038.

Schneider, Friedrich. 2005. "Shadow Economies around the World: What Do We Really Know?" *European Journal of Political Economy* 21(3): 598–642. doi:10.1016/j.ejpoleco.2004.10.002.

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

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

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

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

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

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

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

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

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

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 (May 29, 2024b).

United Nations General Assembly. 1979. *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): 611–22. doi:10.1017/S0003055405051919.

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

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, accessed April* 9(2011): 85.

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

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

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

World Bank. "THE 17 GOALS | Sustainable Development." *Department of Economic and Social Affairs*. https://sdgs.un.org/goals.

Appendix

Summary Statistics

| Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
informality	4620	34	13	8	25	43	82
conflict	4598	0.21	0.5	0	0	0	2
inflation	3991	38	475	-18	2.8	12	23773
unemployment	3061	8	6.4	0.3	3.7	10	39
fdi	4376	3	8.6	-58	0.34	3.5	280
tradeln	4185	4.2	0.56	1.8	3.8	4.5	6.1
wew	4620	0.77	0.42	0	1	1	1
credit	4620	0.89	0.31	0	1	1	1
genderinc	4620	0.58	0.26	0.026	0.36	0.83	0.98
gdppcln	4432	7.7	1.6	4.6	6.4	8.9	12
polity	4573	2.2	7.1	-10	-6	9	10
oil.rent.gdp	4373	3.8	9.4	0	0	1.4	79
oil.high	4373	0.13	0.34	0	0	0	1
genderhigh	4620	0.3	0.46	0	0	1	1
genderhighpre	4620	0.054	0.23	0	0	0	1
wom.civ.ilb	4620	0.65	0.25	0	0.5	0.86	0.98
wom.civ.high.pre	4620	0.056	0.23	0	0	0	1
wom.civ.high	4620	0.28	0.45	0	0	1	1
manufac.perc.gdp	3596	14	6.4	0	9.2	18	50
fuel.exports	3232	0.16	0.26	0	0.0087	0.16	1
food.exports	3339	0.23	0.23	0	0.064	0.33	0.99
agri.raw.exports	3329	0.056	0.097	0	0.0088	0.059	0.89
manuf.exports	3323	0.43	0.31	0	0.13	0.72	3.7
merch.exports.current	4563	38236194828	111520053217	2000000	60950000	2097100000	1577750000
manuf.exports.current	3313	34405590034	100289962374	0	23654525	1713289615	1476616222
agri.exports.current	3319	1077538535	2805662852	0	27288714	767770267	40871172504
manuf.var	3303	0.45	0.31	0	0.14	0.75	3.8
net.oda.per.capita	3445	49	64	-7.1	12	60	711
fem.lfpr.perc.ilo	3061	55	17	8.1	46	67	91
lnodapc	3429	3.2	1.3	-6.1	2.5	4.1	6.6
cso	4620	0.63	0.29	0.013	0.37	0.89	0.98
wbl	4620	59	18	18	47	71	100

Treatment History in the Sample
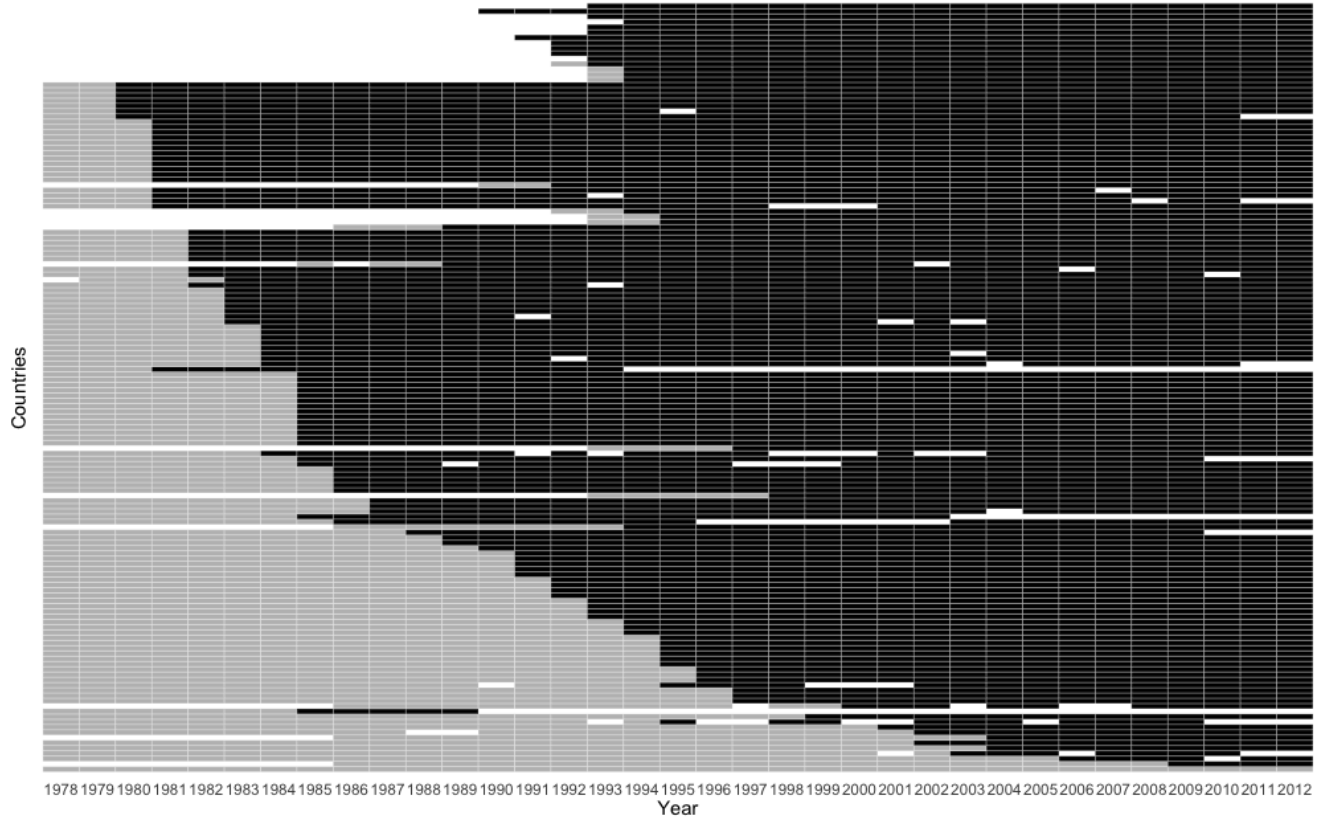
Distribution of Matched Sets – CBPS Weighting
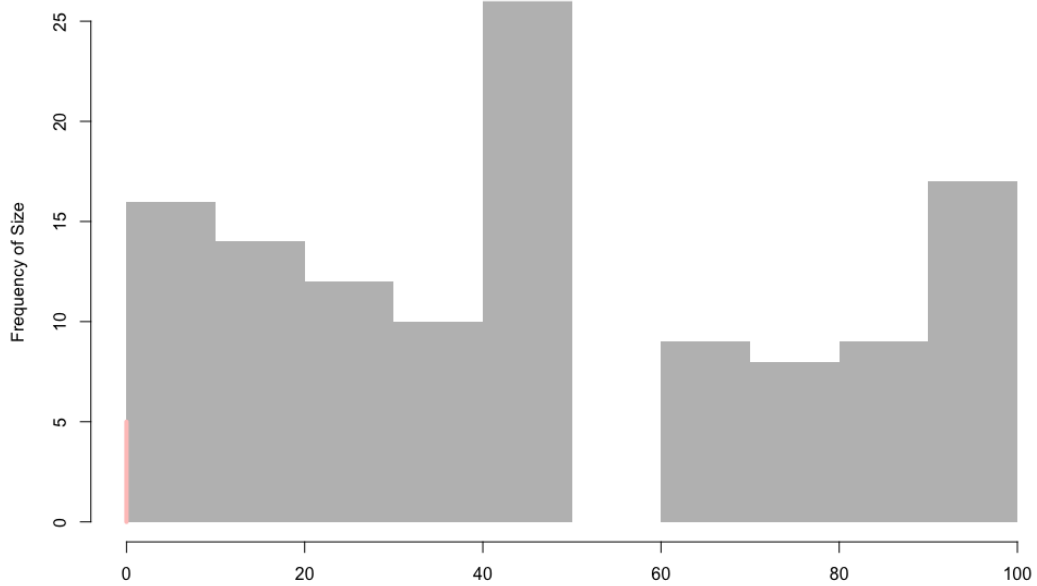
Distribution of Informal Economic Activity in the Sample

Informal Economy Size (% GDP)
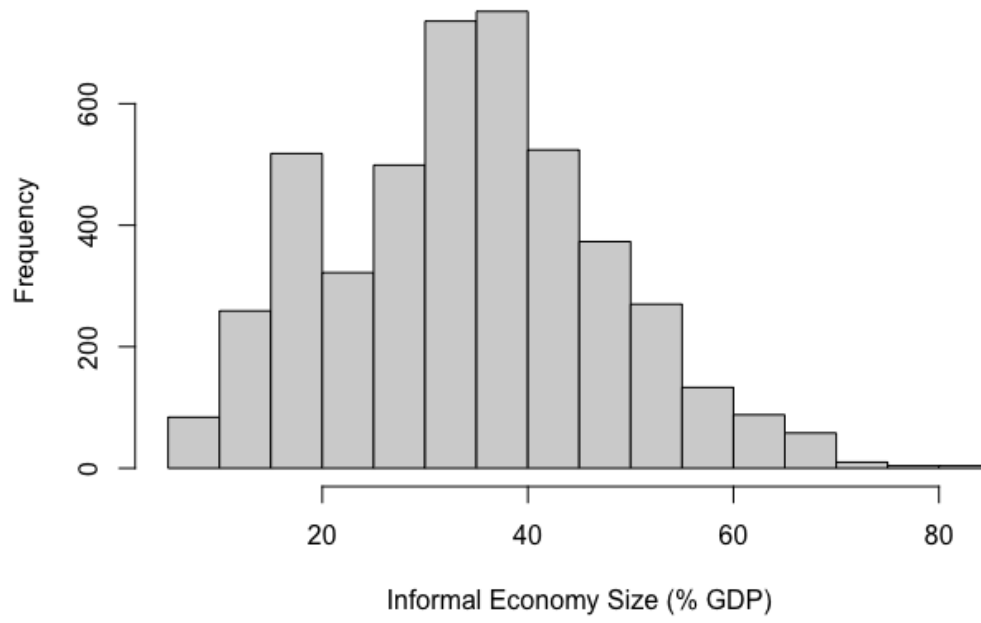
Covariate Balance

BEFORE

Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib.	ODApc(ln)	Fem. Lab. Force
t-3	0.256	0.155	0.934	0.226	0.091	0.081	-0.199	0.244	-0.035	0.199	0.176	0.204	0.157
t-2	0.280	0.021	0.900	0.147	0.109	0.168	-0.103	0.307	0.044	0.151	0.172	0.181	0.073
t-1	0.276	-0.026	0.793	0.122	0.175	0.190	-0.085	0.348	0.012	0.156	0.182	0.140	0.068

CBPS

Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib.	ODApc(ln)	Fem. Lab. Force
t-3	0.053	0.225	1.151	0.400	-0.007	-0.015	0.005	0.045	-0.041	0.011	-0.030	0.410	0.087
t-2	0.081	0.132	1.090	0.335	-0.002	0.020	-0.013	0.058	0.005	-0.011	-0.029	0.389	0.092
t-1	0.089	0.141	1.039	0.314	0.011	0.037	0.006	0.158	0.009	-0.022	-0.039	0.365	0.044

PSW

Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib.	ODApc(ln)	Fem. Lab. Force
t-3	0.041	0.227	1.111	0.391	-0.053	-0.048	0.037	0.107	-0.032	0.004	-0.052	0.394	0.069
t-2	0.068	0.141	1.052	0.322	-0.041	-0.010	0.010	0.110	0.004	-0.018	-0.049	0.377	0.102
t-1	0.077	0.145	0.978	0.273	-0.017	0.012	0.024	0.198	0.014	-0.015	-0.053	0.356	0.073

MDM

| Time	Informality	Inflation	Trade(ln)	GDPpc(ln)	CSO	Polity	FDI	Unemployment	Conflict	Credit	Wom. Civ. Lib.	ODApc(ln)	Fem. Lab. Force
t-3	0.179	0.263	0.047	-0.026	0.022	0.030	-0.098	0.067	0.056	0.077	0.075	-0.190	0.110
t-2	0.204	0.151	0.093	-0.052	0.040	0.132	-0.010	0.160	0.151	0.037	0.076	-0.202	0.071
t-1	0.202	0.091	0.099	-0.014	0.099	0.140	0.027	0.239	0.104	0.059	0.086	-0.187	0.063

Parallel Trends Tests

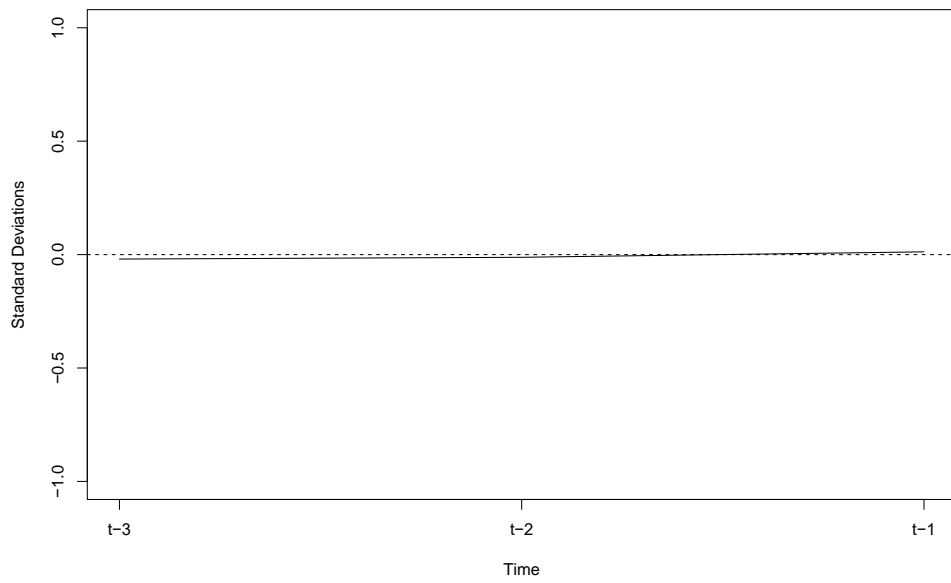### Parallel Trends – World Bank's Women and Equal Work
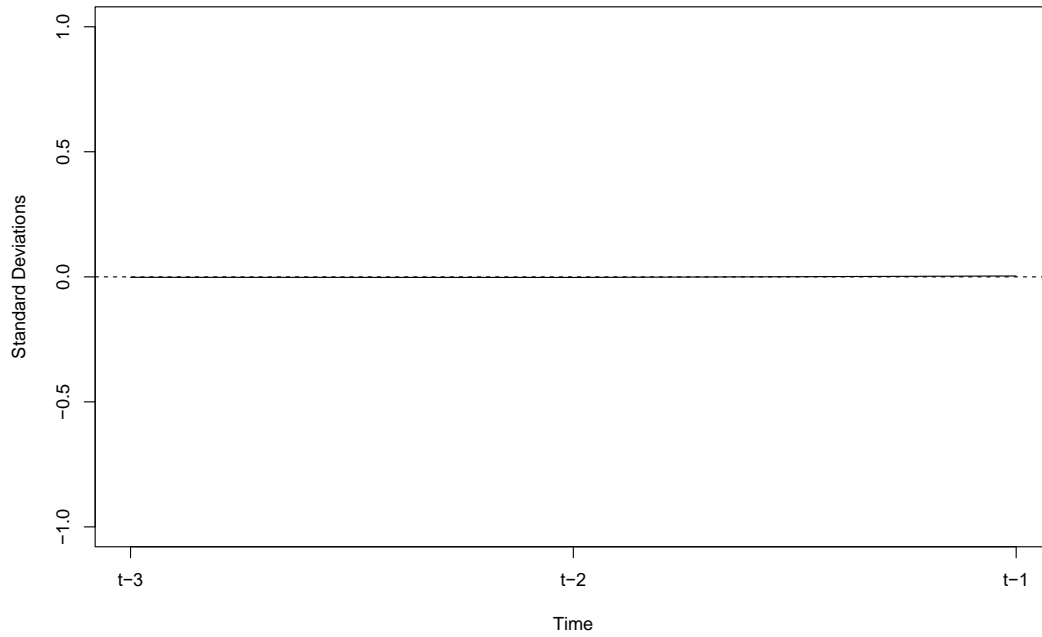
Parallel Trends – CIRIGHTS Women's Economic Rights
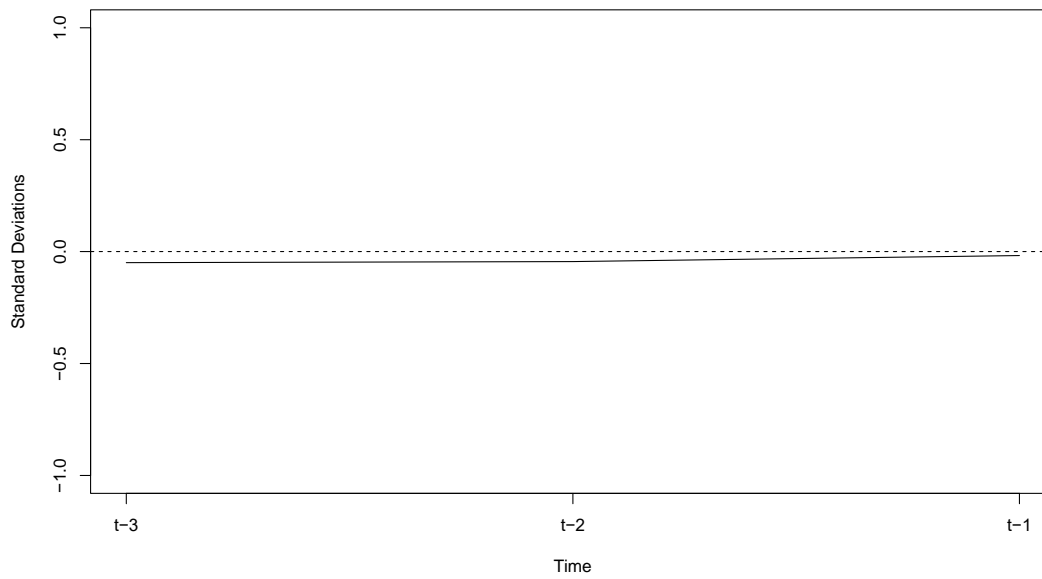
Parallel Trends – World Bank's WBL Index
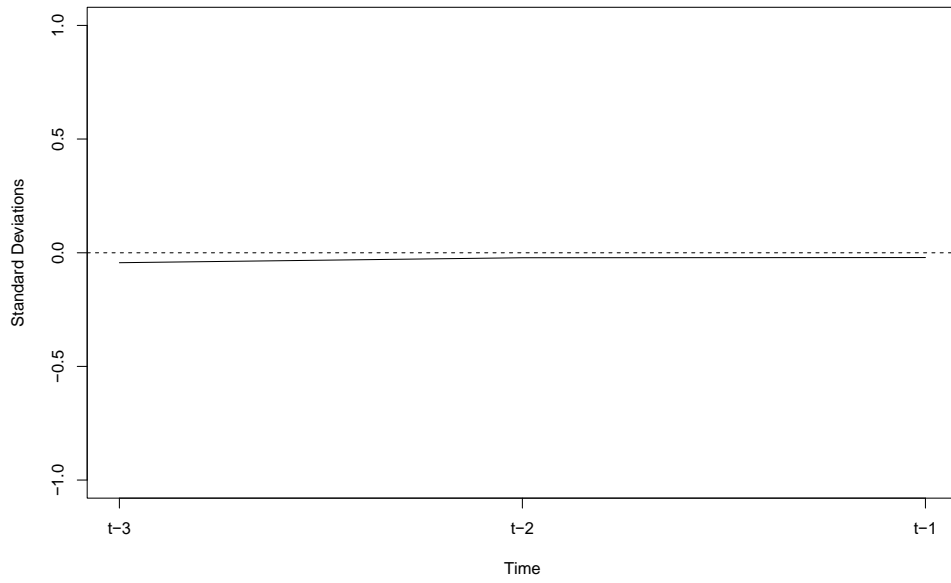
Parallel Trends – Convention Against Torture

Robustness Checks – RESULTS

CBPS 5 lags

Sample	T+3 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: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01

CBPS 5 leads

Sample	T+5 Estimate	Std. Error	95% Conf. Intervals
Global Estimate	-0.80**	0.25	[-1.29 , -0.31]
Oil Dependence (High)	0.27	0.94	[-1.52 , 2.20]
Oil Dependence (Low)	-0.88**	0.26	[-1.42 , -0.38]
Export Manufacturing (High)	-1.39**	0.52	[-2.49 , -0.43]
Export Manufacturing (Low)	-0.15	0.38	[-0.90 , 0.63]
Prior Inclusive Countries	-0.86*	0.43	[-1.73 , -0.03]
Prior Exclusive Countries	-0.76*	0.29	[-1.33 , -0.17]

Note: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01

Propensity Score Weighting

Sample	T+3 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: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01

Mahalanobis Distance Matching

Sample	T+3 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: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01

CIRIGHTS, WBL Index, Heterogeneous Effects in Matching, and Naïve Model

| Model	T+3 Estimate	Std. Error	95% Conf. Intervals
CIRI Women's Economic 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]
Naïve Model	-0.39*	0.17	[-0.73 , -0.05]

Note: Bootstrapped std. errors with 10,000 iterations; † p<0.10 * p<0.05 ** p<0.01; The "Matching on Heterogeneous effects" model uses the size of the informal economy as the dependent variable. Matching is done with all of the main covariates as well as indicators for manufacturing exports, oil dependence, and gender inclusion. The Naïve model omits the women's rights variables from the RHS (credit access and women's civil liberties).

Endogeneity Tests[24]

Do (Previously) High Levels of Gender Inclusion Lead to Ratification? (CBPS)
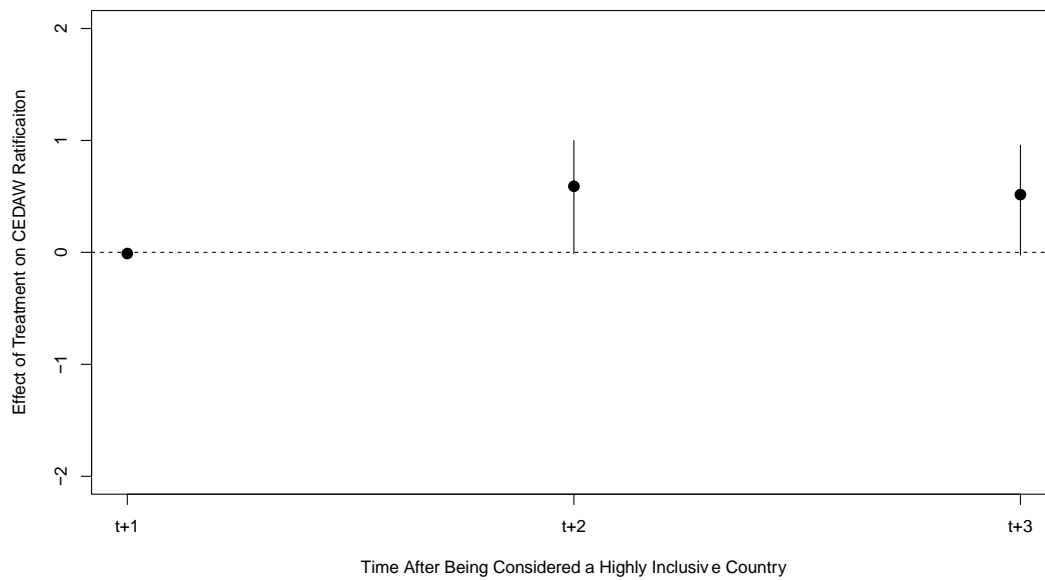

Do (Previously) High Levels of Gender Inclusion Lead to Ratification? (MDM)

---
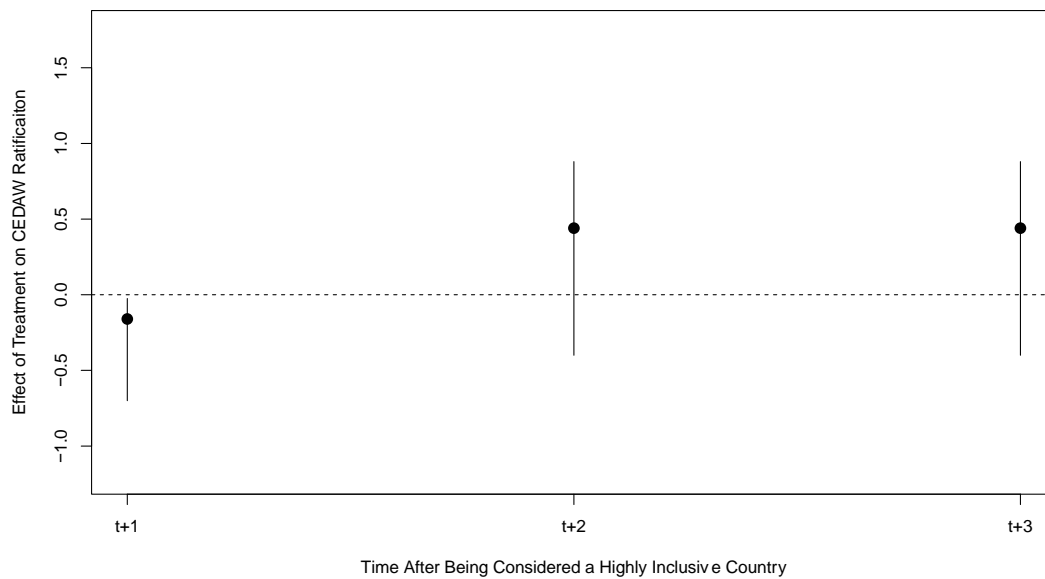
[24] The CBPS algorithm failed to match when unemployment was added to the matching model. An additional test with unemployment in the matching model can be found using Mahalanobis Distance Matching. The outcome variable in the endogeneity tests is a binary indicator for CEDAW ratification.

Do Large Informal Economies lead to CEDAW Ratification?
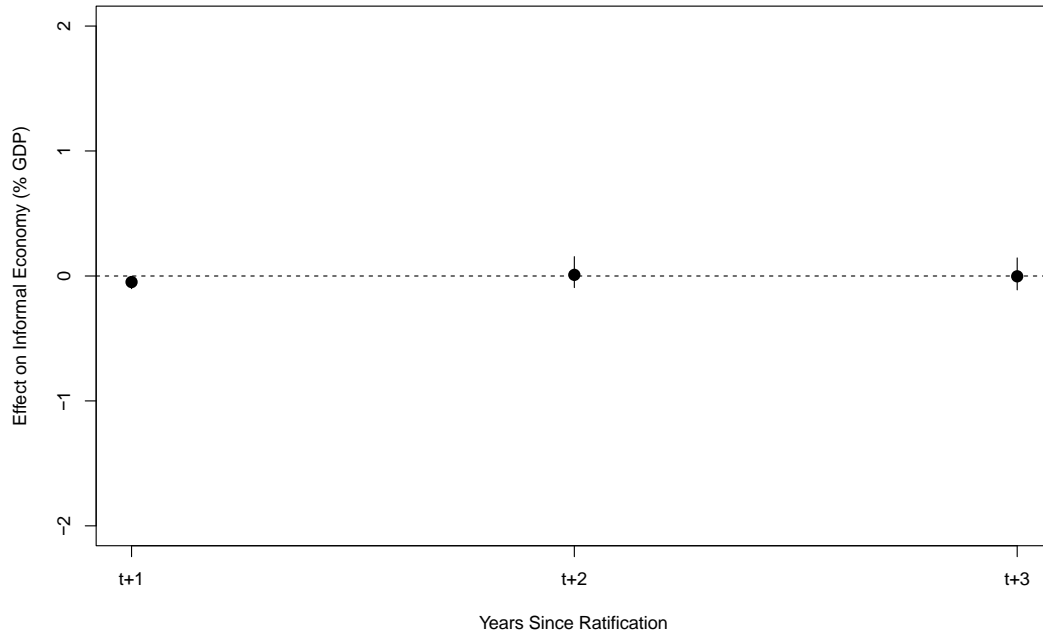
CEDAW Ratification's Effect on the Informal Economy for Countries Bundling Multiple Treaties