Do Legislative Gender Quotas Lower Corruption?

Preliminary Version: This paper is under active development. Many aspects of the paper are incomplete. Errors are probable. Results and conclusions may change as research progresses.

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Abstract

Prior scholarship has established that increased participation of women in government, especially the legislature, can cause decreased corruption in that government in some contexts. An evident implication is that requiring female representation in the legislature through a quota should reduce corruption. However, gender quotas can be implemented in many ways and for varying reasons. Some of these implementations may deliberately or inadvertantly eliminate the efficacy of women to fight corruption. In addition, corruption may cause a government to implement gender quotas in response to international and domestic pressure or as a means of clientelism; this fact muddies the interpretation of any empirical relationship between quotas and corruption. In this paper, we use instrumental variable analysis of country-year data to disentangle the causal relationship between legislative gender quotas and corruption.

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A consensus has emerged in the empirical literature over the last twenty years: in at least some circumstances, greater participation of women in government causes reduced corruption in that government. But this consensus is weaker than it may initially appear. There are many contexts where women's representation is causally unrelated to corruption. Where a causal link exists, the theoretical reason for it is largely unknown; many competing explanations prevail. Without a settled theory, we cannot know whether policy-imposed changes in representation will have the same effect on corruption as changes that occur exogenously. And corruption can, in turn, reduce women's representation in government. For all these reasons, it remains unclear whether or when imposing an increase of women in a country's parliament by legal mandate—a gender quota—will cause a decrease in corruption for that government.

In this paper, we take a step toward empirically determining whether and when legislative gender quotas reduce corruption. We first look to past research to develop theoretical expectations of when quotas are most likely to be effective at reducing corruption. We also develop expectations about when corruption might cause gender quotas to be adopted. Because we expect simultaneity in the relationship between gender quotas and corruption, we use "causal inference" research designs designed to disentangle the two effects.

Our analysis of over twenty-five years of cross-national data using instrumental variables yields four findings. First, we reaffirm the conclusions of earlier work: increased representation of women in government (on average) causes decreased corruption, and increased corruption in turn (on average) causes decreased representation of women in government. Second, in the international system as a whole, legislative gender quotas do not (on average) affect corruption nor are they (on average) affected by corruption. However, in countries where women enjoy real influence over policy, we find that a gender quota *does* (on average) reduce corruption to a substantively meaningful degree. Unfortunately, only countries that are especially susceptible to international and domestic pressure are likely to adopt a

legislative gender quota in response to corruption—and these are not necessarily the same countries where such a quota would actually reduce corruption.

Theory development

Encouraging empirical results have attracted many to the idea that mandating women's representation in government might reduce corruption. However, the theoretical mechanisms that connect these two concepts are complex. Based on the existing scholarship, we argue that the impact of gender quotas on corruption will be highly dependent on how these quotas are implemented, as argued by Bjarnegård, Yoon and Zetterberg (2018). Specifically, gender quotas will only be effective when the women in office are directly accountable to voters and not to government or party patrons: that is, in systems with free, fair, and competitive elections with high clarity of responsibility (Tavits, 2007; Schwindt-Bayer and Tavits, 2016). Moreover, the magnitude of any impact of quotas on corruption will be stronger or weaker—and perhaps even in opposing directions—conditional on institutional and social context. Specifically, women must have sufficient social, financial, and political independence to influence policy when elected to office.[1] We anticipate simultaneity in the observed relationship between gender quotas and corruption, as governments with endemic corruption may adopt gender quotas tailored to impress international and domestic audiences (includ-

[1]The theoretical argument of Bjarnegård, Yoon and Zetterberg (2018) is similar to ours:

> [I]f women elected through quotas are recruited from new networks and with no exposure to a corrupt political system, *and* they are given their own mandate to act on a range of issues once in parliament, then quotas may constitute a 'clean slate' and thus help reduce corruption. However, if the reform is designed in a manner that recruits women from already existing, corrupt networks, and the elected women are expected to protect an already corrupt party line, then quotas may just provide non-democratic regimes with yet another 'tool on the menu of manipulation' (p. 106).

However, our predictions are distinct. In contrast to our predictions, Bjarnegård, Yoon and Zetterberg (2018) argue that quotas will only lower corruption when (a) the reserved seats are filled through a separate system parallel to the ordinary process, and (b) quotas provide representatives in reserved seats with a distinctive policy mandate (pp. 109-110).

ing non-governmental organizations, or NGOs) without interrupting networks of bribery and patronage.

To summarize, theoretical considrations lead us to expect gender quotas to be most effective at causing lower corruption where:

1. female politicans are directly and clearly accountable to voters (as opposed to party or government leaders); and

2. women actively and independently participate in policy-making.

By contrast, we expect corruption to cause a greater likelihood of adopting a gender quota:

1. in authoritarian or clientelistic governments; and

2. in a country more susceptible to pressure from foreign governments and NGOs.

Why might gender quotas lower corruption?

Scholars and policy-makers became interested in increasing women's participation in government as a strategy to fight corruption almost immediately after Dollar, Fisman and Gatti (2001) and Swamy et al. (2001) demonstrated a correlation between women's representation in the legislature and lower corruption in government in observational country-year data. Several governments have even tried feminization as an explicit corruption-fighting measure (Moore, 1999; Quinones, 1999; McDermott, 1999; Karim, 2011; Kahn, 2013; Wills, 2015). The potential advantages of this strategy are obvious. Corruption is by its very nature difficult to observe, may not be considered unethical by its practitioners, and is infrequently or unevenly punished when endemic to a system; these features empower the interests that benefit from corruption to successfully resist reforms. By contrast, it is easy to observe whether there are more women participating in government and many consider gender parity to be morally important on its own terms. These considerations make it harder to subvert or

oppose gender quotas, and in turn make it tempting to see them as a way of achieving quick and politically palatable reductions in corruption.

The strategy may be even more appealing in light of recent empirical findings that utilize research designs tailored to isolate the causal impact of increased women's representation in government on corruption. For example, Jha and Sarangi (2018) study a cross-section of countries worldwide using instrumental variables for women's representation in the legislature, finding that greater representation of women causes lower corruption. Esarey and Schwindt-Bayer (2019) use a different set of instrumental variables to establish that an increased proportion of women in parliament causes reduced corruption in a panel data set of 76 democratic-leaning countries. Paweenawat (2018) does the same, but for Asian countries. Correa Martínez and Jetter (2016) instruments participation of women in the labor force and finds that greater participation causes lower corruption. All of these papers use different instrumental variables for women's representation, and some (e.g. Esarey and Schwindt-Bayer, 2019) use multiple combinations of instrumental variables; this suggests that the overall finding is robust to methodological choices. Brollo and Troiano (2016) use a completely different approach, regression discontinuity design, to establish that female mayors in Brazil are less involved in corruption (measured as a part of randomly administered government audits) and more effective at providing public goods than their male counterparts, at least when elections are competitive. Perhaps most persuasively, Beaman et al. (2009) studies village councils in India where some council leaders (*pradhans*) are randomly assigned by the state to be reserved seats for women, as in a field experiment. Survey respondents in villages reserved for women *pradhans* reported a lower likelihood of paying bribes to the government for basic services (p. 1519).

Experiments and survey data provide a behavioral microfoundation for the macro-level relationship between female representation and corruption. Examining data from the World Values Survey, Torgler and Valev (2010) find that women consistently report greater aversion

to corruption and tax evasion compared to men worldwide. Why? Two explanations are frequently discussed in extant scholarship. First, a long and cross-disciplinary literature has consistently found that women are more averse to risk than men (Sundén and Surette, 1998; Byrnes, Miller and Schafer, 1999; Bernasek and Shwiff, 2001; Watson and McNaughton, 2007; Eckel and Grossman, 2008; Croson and Gneezy, 2009); relatedly, women may be more motivated by guilt, shame, and regret than men (Ward and King, 2018). Thus, where corruption is risky (i.e. subject to discovery and punishment) or stigmatized, women may be more reticent to take that risk in order to gain the reward. This explanation is supported by observational evidence that the gender-corruption linkage only exists in places where accountability for corruption is high (Alhassan-Alolo, 2007; Esarey and Chirillo, 2013; Esarey and Schwindt-Bayer, 2018), by studies indicating that people expect this behavior from women in government positions (Barnes and Beaulieu, 2014; Barnes, Beaulieu and Saxton, 2018), and by experiments demonstrating that women are only less willing to engage in bribery than men when detection and punishment are possible (Schulze and Frank, 2003). Second, women may be held to a higher standard when it comes to corruption compared to men. For example, Wagner et al. (2017) found that male police officers in Uganda were more lenient than women in evaluating and punishing fellow male police officers for corrupt activities, but equally strict when evaluating female police officers. Among voters, Eggers, Vivyan and Wagner (2018) find that women voters in Britain more harshly punish female members of parliament involved in misconduct compared to male MPs involved in the same conduct; male voters treated MPs of both genders equally.[2]

Our overall interpretation of this evidence is that there are good reasons to suspect that exogenously increasing the participation of women in government, such as by passing a gender quota, might lower corruption in that government. Specifically, we expect that (for several

[2]However, Schwindt-Bayer, Esarey and Schumacher (2018) found no tendency to more harshly judge women suspected of corruption among voters in Brazil or the United States in their survey data.

possible reasons) women will be less willing to participate in corruption than equivalent men in the same position. However, the literature also suggests many exceptions, provisos, and qualifications to this conclusion. For example, an experiment by Alatas et al. (2009) finds that women are less willing to pay or accept bribes and more willing to punish them, but in Australia (and not in India, Indonesia, or Singapore). In short, we expect that quotas will not only fail to lower corruption in many circumstances, there may be cases where they *raise* corruption.

What conditions are required for gender quotas to successfully lower corruption?

Though gender quota adoption seems like a promising solution to corruption problems, their success is highly contingent on the way in which they are implemented and how much, if any, power they grant to the women they put in office (Bjarnegård, Yoon and Zetterberg, 2018). For example, in their empirical analysis of Sweden's gender quota, O'Brien and Rickne (2016) find that the quota caused an increase in women's political leadership. But it is not guaranteed that the adoption of gender quotas will raise the representation of women in government, and they must do so in order to have a chance of lowering corruption. Policies must be (a) carefully and clearly written and (b) enforced with meaningful penalties to motivate parties to comply. For example, policies in proportional representation (PR) systems which do not specify the placement of women on party lists allow parties to subvert the quota by placing all women candidates at the end of these lists; this occurred in France among right-wing parties in 2002 (Krook, 2009, Chapter 6). As another example, quotas with lenient penalties for noncompliance (such as the imposition of a small fine) are often ignored, as parties choose to pay rather than implement the quota; this also occurred in the French context (p. 198). However, severe repercussions for violating the quota are

effective in forcing compliance. For example, Argentina implemented sanctions when they saw their quota law failing. These sanctions gave judges the power to rewrite party lists when parties did not comply with the quota, increasing women's representation (Krook, 2009). In contrast, Brazil the quota law does not have any sanctions, and parties choose to leave the seats vacant rather than fill them with women (Miguel, 2012).

Gender quotas have the potential to increase women's representation, but this is not the only condition necessary for quotas to have a negative effect on corruption. The quotas must also give women the agency to effect change in government. In Morocco, for example, seats in the parliament are reserved for women, but this parliament has no power; therefore, parliamentary seats are more akin to patronage positions. Consequently, loyalty to the monarchy (the source of real political power) prevents members of parliament from acting independently (Sater, 2012). Similarly, although Rwanda's parliament included 48.8 percent women in 2003, it is powerless to criticize the regime. Thus, women's representation in parliament serves to legitimize the RPF, but is unable to create change (Longman, 2006; Burnet, 2012). These examples may explain the discrepancy between how women's representation changes corruption in democratic-leaning and autocratic-leaning governments found by Esarey and Chirillo (2013). Specifically, they find that women's representation has a negative effect on corruption but only in states with democratic-leaning forms of government.

Even representation in a meaningful parliament may not result in policy influence. In Pakistan, for example, male legislators vote to select female legislators for the reserved seats. Because of this, "whenever female legislators took positions on issues of concern to women, their male colleagues reminded them that they had been elected by men and not women" (Krook, 2009, p.66). The example illustrates that women who are not directly responsible to a voting consistuency have a weaker base of legitimacy from which to make policy (Matland, 2006; Hassin, 2010). South Africa provides another example:

> ANC [African National Congress] governing elites used their electoral domi-

> nance, the PR [proportional representation] system, and the quota to undermine women's counterpublics and discipline female MPs [members of parliament]. ...An expansion of the ANC's voluntary quota to 50 percent has not resolved these problems. Instead, elites continue to herald the quota, claiming a commitment to participatory poltics and women's rights that no longer exists (Walsh, 2012, p. 130).

A similar situation exists in Tanzania (Bjarnegård, Yoon and Zetterberg, 2018). In such circumstances, we would not expect a gender quota to produce changes in policy (including reductions in corruption) even though the legislature has real power.

Symbolic or ineffective representation of women may actually result in women becoming less interested in political activity. Wolchik (1994) emphasizes this point in her analysis of the Czech and Slovak republics during and after communism. Women's representation was largely symbolic under communist rule. When the communist regime fell, so did women's representation. In fact, women's forced mobilization during the communist era resulted in a backlash effect, and women are now less interested in holding political office. Liu and Dionne (2019) examine a similar backlash effect in African states in which women have more political than social and economic rights. In these states, which they call paradoxical countries, they argue that greater women's representation causes women at large to be *less* engaged in politics. Zetterberg (2012) comes to a similar conclusion in Mexico, and finds there is a statistically significant negative effect of quota adoption on women's political interest. For these reasons, the backlash effect of quota implementation may prevent even effectively legislated quotas from increasing women's influence on politics because of social repercussions.

Although (as discussed in the previous section) we have reasons to believe that women in government may combat corruption, some gender quotas could simply enable corrupt officials to install female allies in government positions who are willing to participate in

corrupt activity. The recent examples of Cristina Fernàndez de Kirchner in Argentina and Dilma Rousseff in Brazil indicate that women can be powerful participants in government corruption. Although prior scholarship has shown that networks of people involved in corrupt activities fear exposure by women outsiders (Bjarnegård, 2013; Grimes and Wängnerud, 2012; Stockemer, 2011; Sundström and Wängnerud, 2014), corruption networks may be able to design and structure a quota to favor women who are insiders. In that event, the increased women's representation the quota creates will not reduce corruption.

Even if gender quotas are effective at raising women's representation, that representation is substantively meaningful, and the quotas do not result in women being integrated into existing corruption networks, there is still a possibility that any empirical relationship between women's representation and corruption is spurious. For example, some scholars argue that cultural factors cause increased women's representation and lower corruption. Hofstede (2001) finds consistent patterns of answers to survey questions in varying countries that he labels as cultural dimensions; these dimensions include Power Distance, Uncertainty Avoidance, Masculinity (prioritizing success and competition over relationships and security), and Collectivism (valuing community over self) (see also Yeganeh, 2014, pp. 6-8). Yeganeh (2014) provides empirical evidence that countries with lower average scores on these cultural dimensions are less corrupt according to the Transparency International Corruption Perception Index (TI CPI) (Transparency International, 2019, 2016). Yeganeh (2014) also finds that the Self-Expression and Rational-Secular dimensions of culture developed by Inglehart (1997) and based on questions in the World Values Survey are associated with corruption; countries with higher average scores on these dimensions are less corrupt (see also Inglehart and Welzel, 2003).

Why might corruption cause gender quotas to be implemented?

Studying the effect of gender quotas on corruption is difficult because governments, and especially corrupt governments, may adopt quotas specifically to answer criticisms emanating from foreign governments or international and domestic NGOs (Krook, 2006; Bush, 2011; Hughes, Krook and Paxton, 2015). Governments receiving foreign assistance are especially susceptible to this pressure. This pressure is a potential source of simultaneity in the causal process: our dependent variable (corruption) can cause our independent variable (gender quotas) because corruption generates pressure for reform. Even worse, and as described in the previous section, quotas may be implemented with no intent of genuinely changing the structure of power and patronage relationships. We may therefore anticipate that gender quotas might not only be caused by corruption, but designed specifically to be ineffective at empowering women and/or reducing corruption. Of four theoretical explanations for gender quota adoption that Krook (2006) discusses, at least two are suggestive of simultaneity between corruption and gender quotas: "political elites recognize strategic advantages for supporting quotas" and "quotas are supported by international norms and spread through transnational sharing" (p. 307; see also Krook, 2009).

There are many case studies of governments and parties that implement gender quotas as a mechanism of patronage or to crowd out political opposition without conferring real power to women. For example, gender quotas imposed by the ruling party in Senegal in the 1980s were "motivated primarily by competition between men... for control of the ruling party" where a new leader "sought to create new clients who would be dependent upon his political largesse in order to detract from the power of the party 'barons'" (Beck, 2003, p. 156). Thus, gender quotas were implemented specifically as a means of creating patronage, a form of corruption which facilitates corruption in other forms. In Rwanda, a case mentioned in the previous section, women's relatively subordinate position in Rwandan society may have made them more susceptible to pressure from the regime and therefore a favorable target for

patronage. The government includes women to present a false front of legitimacy:

> One person told me: "The RPF focuses on diversity so that they can appear democratic even though they control all power. They put women in the National Assembly because they know they [the women] will not challenge them" (Longman, 2006, p. 148)

Countries like Senegal and Rwanda might be particularly prone to implement quotas precisely because their endemic corruption creates incentives to broaden and reinforce existing clientelistic politics.

Pressure from the international community can motivate the imposition of gender quotas, but these quotas could be superficial if women are socially, politically, and economically unable to take advantage of their positions (Liu and Dionne, 2019). Bush (2011) finds "strong evidence that international incentives are positively and significantly related to a country's likelihood of adopting a gender quota" (p. 104); these incentives are foreign aid, support from the United Nations for post-conflict operations that supported political liberalization, and/or election observers. But in Afghanistan, where gender quotas were imposed as a part of a post-war reconstruction process strongly influenced by Western governments, "women's considerable presence in the parliament has not led to the substantive representation (or definition) of the interests of 'women in general' (Larson, 2012)." Similarly, in Latin America, transnational organization and activism motivated the proposal and (in some cases) passage of gender quotas in some countries (Htun, 2016, pp. 52-54). However, as we noted in the previous section, such laws were sometimes unenforced (Miguel, 2012) or structured in ways that make them ineffective for challenging entrenched interests (Htun, 2016, Chapter 7), including those interests that profit by corruption. In these circumstances, transnational pressure might be effective at creating a gender quota but we would not expect those quotas to have a meaningful impact on corruption.

Most concerningly, increased global pressure for quotas is *less* effective in countries with strong domestic ties to women's transnational organizations (Hughes, Krook and Paxton, 2015). One possible explanation for this paradoxical moderation effect is that male elites "see quotas as a challenge to their power and position" (p. 359) and are more threatened by quotas when domestic women's interests groups are stronger and more organized. That is, quotas may be less likely to be implemented precisely where they are more likely to be effective at reducing corruption because extant (male) elites are most harmed by them in those circumstances.

Data

To determine how gender quotas and corruption influence each other, we rely primarily on data from version 9 of the Varieties of Democracy (V-Dem) country-year data set (Coppedge et al., 2019; Pemstein et al., 2019) with some additional data from the 2019 edition of the Quality of Government time-series cross-sectional data set (Teorell et al., 2019). Summary statistics for our data are presented in Table 1. The variables in which we are interested are included in this table.

The V-Dem legislative corruption index uses evaluations from multiple country experts to determine whether "members of the legislature abuse their position for financial gain," including briberty, nepotism, and forms of graft (Coppedge et al., 2019, pp. 134-135); these ratings are then converted to a continuous measure using an item response model (Pemstein et al., 2019).[3] We have reversed the coding of this measure so that larger values indicate

[3]We initially used the Transparency International Corruption Perceptions Index (TI CPI) from the Quality of Government dataset (Teorell et al., 2019); however, results with this dependent variable were confusing and inconsistent. We believe these problems were related to the relatively small number of years available for the TI CPI and the high degree of missingness for the first ten years of the measure. Unlike TI CPI, the V-Dem legislative corruption index is targeted at corruption in the legislature and is available for the full length of our panel with minimal missingness. We hope to confirm results using the International Country Risk Group measure of Political Risk due to corruption in a future draft.

Table 1: Data Set Summary Statistics

	N	mean	sd	min	max
V-Dem Legislative Corruption Index	4458	0.225	1.340	-3.322	3.265
% Women in Parliament	4410	15.698	11.021	0.000	63.800
Gender Quota in Legislature	4458	0.214	0.410	0.000	1.000
V-Dem Gender Power Index	4458	0.904	1.102	-2.854	3.876
Revised Combined Polity Score	4031	3.490	6.505	-10.000	10.000
Mean GDP PC in 2010 USD	4381	11937.105	17420.476	163.623	95193.617

Data are present for 174 countries between 1992 and 2018. Panels are unbalanced due to missing data.

more corruption. The proportion of women in the lower (or only) chamber of the legislature is compiled by the V-Dem authors using multiple sources. The existence of a gender quota in this chamber of the legislature (including reserved seats or statutory quotas, but excluding voluntary party quotas) is sourced from the QAROT data (Coppedge et al. 2019, p. 144, Hughes et al. 2019). The V-Dem gender power index measures how "political power [is] distributed according to gender" (Coppedge et al., 2019, p. 191) using country expert ratings converted to a continuous scale by an item response model; larger values indicate a more equal distribution of power between men and women. The revised combined Polity score is sourced from the Quality of Government data set (Teorell et al., 2019) and rates countries on a scale from -10 (most autocratic) to 10 (most democratic) according to "key qualities of of executive recruitment, constraints on executive authority, and political competition" (Center for Systemic Peace, 2019). Finally, average per capita GDP in 2010 prices by country comes from the Quality of Government data set (Teorell et al., 2019) and the World Bank's World Development Indicators (World Bank, 2016).

Modeling strategy

To ensure that our findings are not overly sensitive to modeling choices, we present three different models:

1. a basic fixed effects (FE) model with controls for country and year;

2. a fixed effects model with instrumental variables (IVs) using two-step feasible GMM (Baum, Schaffer and Stillman, 2003, 2007); and

3. a dynamic panel data (DPD) model with year fixed effects (Roodman, 2009), in both system (Blundell and Bond, 1998) and difference (Holtz-Eakin, Newey and Rosen, 1988; Arellano and Bond, 1991) one-step GMM variants with robust standard errors.

All models are estimated in Stata 15.1 using the `xtreg`, `xtivreg2`, and `xtabond2` routines. Standard errors are clustered on country unless otherwise indicated.

For the fixed effects models, we face a difficult choice of whether to include a lagged dependent variable in the model. Although such models suffer from Nickell bias (Nickell, 1981; Judson and Owen, 1999), this bias reduces as the time dimension of the data set increases. In most of our models, on average a country is observed for more than 25 years. We therefore elect to include the lag of the dependent variable in all models except when explicitly implementing a difference-in-difference strategy for estimating the effect of legislative gender quotas on corruption. Our DPD models overcomes the possibility of Nickell bias, but replace it with the possibility of sensitivity to specification (e.g., in the number of lags used as instruments or in whether both difference and level moment conditions are used in estimation). Given the possible deficiencies in each approach, we believe that our conclusions will be most robust in the case where most or all such models indicate a similar answer.

The first and second lags of a variable serve as our instruments for that variable. This instrumentation strategy, which is not unlike the strategy employed in a dynamic panel data

model, makes the exclusion restriction that an instrumented independent variable $x_{(t-1)}$ observed at time $t-1$ is independent of y_t conditional on x_t and y_{t-1}; including the lagged dependent variable in the model serves to block that plausible back-door pathway of influence.

Results

To verify the validity of our approach and provide additional support for the theoretical underpinnings of our research, we begin by revisiting prior results from the literature using this larger, more current data set. Specifically, we verify the findings of Esarey and Schwindt-Bayer (2019) that

1. the proportion of women in the legislature lowers corruption; and

2. greater corruption reduces the proportion of women in the legislature.

Table 2 presents our examination of the first finding. In all of our models, a greater proportion of women in government is associated with lower corruption; two of the three estimated relationships are statistically significant, and the coefficient in the fixed effects IV model has a two-tailed p-value of 0.110. The instantaneous relationships are substantively small: for example, in the system DPD model, a 10% increase in women's representation in the legislature causes a 0.024 point decline in the corruption index on what is roughly a six point scale.

Due to the presence of a lagged dependent variable in the model, the coefficient on % women in the lower house reflects only the immediate impact on corruption (Keele and Kelly, 2006); to calculate the full (long run) effect of a variable x, we must calculate:

$$LR = \frac{\beta_x}{(1 - \sum_{j=1}^{T} \beta_{y_{(t-j)}})} \tag{1}$$

Table 2: Estimates for causal impact of women's representation on corruption in the legislature

	FE	FE IV	System DPD	Diff. DPD
lag corruption	0.831***	0.855***	0.958***	0.705***
	(31.87)	(42.77)	(85.54)	(17.83)
% women in lower house	-0.00214**	-0.00179	-0.00238***	-0.000687
	(-2.16)	(-1.60)	(-3.33)	(-0.26)
Observations	4236	4028	4236	4034
Countries	174	174	174	174
Years	26	25	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		1.011	140.9	150.5
Hansen's J p-value		0.315	1	1
1st stage F-stat (Kleibergen-Paap)		2616.7		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: V-Dem legislative corruption. FE IV model uses first and second lag of % women in the lower house as excluded instruments. System and Difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

When making this calculation for the system DPD model in Table 2, we find that a 10% increase in representation of women causes an 0.57 point decline in the corruption index ($p = 0.001$), just under 9% of the full range of the corruption scale.

Table 3 shows our analysis of the effect of corruption on the proportion of women in the legislature on corruption. Consistent with previous research, increased corruption is associated with lower representation of women in government. Specifically, a 1 point increase on the V-Dem measure of corruption in the legislature is associated with about an immediate decline in women's share of legislative seats of about 0.25 percentage points. In the long run, the fixed effects IV model estimates that a 1 point increase in corruption reduces women's representation in the legislature by 1.6 percentage points ($p = 0.053$, two-tailed).

Table 3: Estimates for causal impact of corruption in the legislature on women's representation

	FE	FE IV	System DPD	Diff. DPD
lag % women in lower house	0.836***	0.834***	0.956***	0.781***
	(71.48)	(70.63)	(91.56)	(30.02)
corruption	-0.242*	-0.262*	-0.295***	-0.229
	(-1.88)	(-1.91)	(-3.28)	(-0.65)
Observations	4230	4034	4230	4028
Countries	174	174	174	174
Years	26	25	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		1.181	146.1	146.1
Hansen's J p-value		0.277	1	1
1st stage F-stat (Kleibergen-Paap)		912.2		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: percentage of women in the lower or sole house of the legislature. FE IV model uses first and second lag of legislative corruption score as excluded instruments. System and Difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

The results of Tables 2 and 3 are not theoretically groundbreaking, but the congruence of these findings with past results gives us greater confidence that our more novel findings are valid.

The effect of quotas on corruption

In Table 4, we apply the modeling strategies above to estimate the effect of legislated quotas on corruption in the legislature. All of the models that use instrumental variables find that such a quota has a substantively small and statistically uncertain, but negative, effect on corruption. This evidence leads us to conclude that quotas probably do *not* lower corruption in general.

However, theory leads us to expect that the effect of quotas on corruption may be strongest in places where women are empowered to influence policy and where they are accountable to voters. Therefore, we separately analyze the effect of quotas on corruption (1) in places with high ratings on the V-Dem gender power index, and (2) in countries that lean democratic (i.e., have scores greater than zero on the Polity scale)[4] A repetition of our analysis in Table 4 among only country-years at or above the 90th percentile on the V-Dem gender power index is shown in Table 5. Among these country-years, gender quotas in the legislature have a substantively meaningful and negative effect on corruption: the presence of a quota instantaneously lowers the corruption score by between 0.05 and 0.2 points. In the long run, such a quota is predicted by the fixed effects IV model to lower corruption by 0.38 points; this is over 6% of the largest possible change on the corruption scale. By contrast, we find no statistically detectable effect among democratic-leaning countries (shown in Appendix Table 9).

To ensure the robustness of our conclusions about the effect of legislative gender quotas

[4]The idea behind using Polity is that legislators in more democratic countries are *ipso facto* more accountable to voters than more autocratic countries.

Table 4: Dynamic model estimates for the effect of legislative gender quotas on corruption in the legislature

	FE	FE IV	System DPD	Diff. DPD
lag corruption	0.822***	0.836***	0.963***	0.578***
	(29.00)	(33.79)	(73.32)	(6.95)
presence of legislated quota	-0.0396*	-0.0207	-0.00268	-0.0931
	(-1.83)	(-1.19)	(-0.20)	(-1.35)
Observations	4251	4096	4251	4050
Countries	173	173	173	173
Years	26	25	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		0.730	150.8	141.4
Hansen's J p-value		0.393	1	1
1st stage F-stat (Kleibergen-Paap)		9599.3		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: V-Dem legislative corruption. FE IV model uses first and second lag of % women in the lower house as excluded instruments. System and Difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

Table 5: Dynamic model estimates for the effect of legislative gender quotas on corruption in countries above the 90th percentile of the V-Dem gender power index

	FE	FE IV	System DPD	Diff. DPD
lag corruption	0.740***	0.815***	1.010***	0.668***
	(10.54)	(15.84)	(161.60)	(8.57)
presence of legislated quota	-0.118**	-0.0706*	-0.0481***	-0.199***
	(-2.31)	(-1.95)	(-3.43)	(-3.50)
Observations	423	405	423	415
Countries	32	31	32	32
Years	26	25	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		1.486	17.08	16.88
Hansen's J p-value		0.223	1	1
1st stage F-stat (Kleibergen-Paap)		206.0		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: V-Dem legislative corruption. FE IV model uses first and second lag of % women in the lower house as excluded instruments. System and Difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

on corruption, we used another identification strategy to analyze the effect of quotas on corruption: difference-in-difference (DiD) analysis. DiD with fixed effects measures the change in corruption caused by imposition of the quota net of pre-existing trends in the data (which are assumed to be parallel across treated and untreated units) and unit heterogeneity. These results are shown in Appendix Table 10. Our substantive findings are qualitatively similar: quotas have no statistically detectable effect on corruption in the full sample, but do reduce corruption by between 0.32 and 0.37 points among country-years above the 90th percentile on the V-Dem gender power index.

The effect of corruption on enactment of quotas

We have theoretical reasons to believe that countries might implement gender quotas for their legislature as a genuine effort to lower corruption, possibly in response to international and/or domestic political pressure related to that corruption. However, this is not true for all countries as a whole; our analysis for the full data set is presented in Table 6. In this analysis, we find that corruption has no substantive effect on the implementation of legislative gender quotas. Consequently, it makes sense to focus on subsets of countries that we think will either find it especially painless to implement these quotas and/or are most susceptible to foreign pressure to enact them.

Theoretically, we believe that corruption might be especially likely to cause imposition of a quota in circumstances where women are accountable to leaders rather than voters. In these cases, we expect that appointing women to the legislature (1) might be a form of patronage that serves existing networks of corruption, and/or (2) is not relevant to policy making and is therefore a low-cost way for the regime to placate observers without disrupting those corruption networks. Therefore, we analyze data from autocratic-leaning regimes (operationalized as country-years with Polity scores less than or equal to zero) in Table 7. However, none of our models find a statistically detectable effect of quotas on corruption in

Table 6: Dynamic model estimates for the effect of corruption on enactment of legislative gender quotas

	FE	FE IV	System DPD	Diff. DPD
lag presence of legislated quota	0.872***	0.856***	0.967***	0.802***
	(104.67)	(86.18)	(169.70)	(21.62)
lag corruption	-0.00129	-0.00718	0.000596	-0.00734
	(-0.24)	(-0.93)	(0.12)	(-0.38)
Observations	4284	3877	4284	4078
Countries	173	173	173	173
Years	26	24	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		0.969	173.3	172.1
Hansen's J p-value		0.325	1	1
1st stage F-stat (Kleibergen-Paap)		747.0		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: presence of a legislated gender quota (legal candidate mandates or reserved seats) for the lower or sole house of parliament. FE IV model uses second and third lag of legislative corruption score as excluded instruments. System and difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

this context.

Table 7: Dynamic model estimates for the effect of corruption on enactment of legislative gender quotas among autocratic-leaning country-years

	FE	FE IV	System DPD	Diff. DPD
lag presence of legislated quota	0.907***	0.901***	0.967***	0.757***
	(71.60)	(58.15)	(80.65)	(11.23)
lag corruption	-0.00134	-0.00345	-0.00680	-0.0224
	(-0.13)	(-0.22)	(-0.56)	(-0.89)
Observations	1244	1086	1244	1164
Countries	88	81	88	83
Years	25	23	25	24
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		2.555	46.33	55.41
Hansen's J p-value		0.110	1	1
1st stage F-stat (Kleibergen-Paap)		92.74		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: presence of a legislated gender quota (legal candidate mandates or reserved seats) for the lower or sole house of parliament. FE IV model uses second and third lag of legislative corruption score as excluded instruments. System and difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

Not all countries are equally susceptible to international and domestic political pressure; perhaps the most susceptible countries are also the most likely to implement a legislative gender quota in response to high corruption. To determine whether this is so, we parcel out those countries that fall at or below the 15th percentile of mean GDP per capita. We think that countries with a low per capita GDP are especially sensitive to international pressure because those countries:

1. are more likely to require economic and military assistance, and thus are subject to greater leverage from foreign governments and NGOs who provide that assistance;

2. are more likely to face domestic political pressure related to corruption due to the dissatisfaction created by poverty; and

3. have fewer resources to react to political pressure in other ways, such as by repressing dissent through police and military action.

The results from an analysis of these low GDP countries are reported in Table 8.

Under these circumstances, we find a statistically significant positive effect of corruption on the probability that a quota will be enacted in two of four models that we examine. According to our fixed effects model with instrumental variables, a one point increase in corruption score will cause an immediate 3 percentage point increase in the probability of enacting a legislated parliamentary gender quota. In the long run, this translates to about a 19 percentage points increase in probability of quota adoption ($p = 0.022$, two-tailed). However, we note that the other two models find a substantively tiny and statistically insignificant causal relationship. We have reasons to prefer the instrumental variables models to the fixed effects model without IVs; specifically, we anticipate simultaneity between corruption and quota enactment. But it is unclear to us whether the System or Difference DPD model should be preferred when their findings strongly differ, as they do here.

Conclusion

In this paper, we explore the causal relationship between legislative gender quotas and corruption. There are many plausible theoretical explanations of how this relationship works and what different factors affect its magnitude. Based on extant work, we theorized that quotas would be most effective in lowering corruption in cases where (a) women are accountable to voters and (b) they have agency to participate in policy making. We also theorized that corruption would be most likely to cause quota adoption in authoritarian or clientelistic governments and in countries susceptible to international and domestic political pressure.

Table 8: Dynamic model estimates for the effect of corruption on enactment of legislative gender quotas among countries at or below the 15th percentile of mean GDP per capita

	FE	FE IV	System DPD	Diff. DPD
lag presence of legislated quota	0.871***	0.836***	0.963***	0.778***
	(40.33)	(40.02)	(65.54)	(24.30)
lag corruption	0.0134	0.0318**	0.0000193	0.0221*
	(1.47)	(2.27)	(0.00)	(1.74)
Observations	641	558	641	598
Countries	28	28	28	28
Years	26	24	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		0.135	5.741	8.663
Hansen's J p-value		0.714	1	1
1st stage F-stat (Kleibergen-Paap)		47.11		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: presence of a legislated gender quota (legal candidate mandates or reserved seats) for the lower or sole house of parliament. FE IV model uses second and third lag of legislative corruption score as excluded instruments. System and difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

In the world as a whole, we find little evidence for any substantively meaningful causal relationship between corruption and quotas. Thus, we believe that the exogenous imposition of a gender quota will not curb corruption in most cases. Though women in parliament may have meaningful relationships with corruption in both directions, we find this does not translate to gender quotas having a similar effect.

However, we do find an important context where legislative gender quotas appear to lower corruption. Specifically, such quotas reduce corruption in countries with the most gender-equal access to political power. This finding is consistent with the theory that women's effect on corruption is contingent on their agency to effect change. In addition, there is some evidence that corruption may prompt countries that are susceptible to international pressure to implement a quota. Specifically, countries with very low GDP per capita are more likely to implement a legislative gender quota when they face high corruption. Unfortunately, there is no guarantee that the countries most likely to adopt these quotas are also the countries where the quotas will actually lower corruption.

Our findings leave many questions unanswered. We think one interesting line of future research would explore how the specifics of quota implementation change their effectiveness in reducing corruption. In particular, we think it is possible that a quota that mandates a "critical mass" of women in parliament may be necessary to reduce corruption. Perhaps women cannot be an effective, independent, and distinct force in policy-making—including reducing corruption—until there are a sufficient number of them to change the overall legislative environment, including the behavior of men. Research on the importance of critical mass may give us more insight into how increasing women's descriptive representation impacts their substantive representation, in turn lowering corruption.

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Appendix Tables

Table 9: Dynamic model estimates for the effect of legislative gender quotas on corruption in the legislature in democratic-leaning countries

	FE	FE IV	System DPD	Diff. DPD
lag corruption	0.738***	0.752***	0.960***	0.549***
	(13.93)	(15.57)	(69.84)	(6.42)
presence of legislated quota	-0.0266	0.00659	0.00667	-0.117
	(-1.31)	(0.24)	(0.40)	(-1.57)
Observations	3032	2899	3032	2908
Countries	172	172	172	172
Years	26	25	26	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		1.198	149.9	149.9
Hansen's J p-value		0.274	1	1
1st stage F-stat (Kleibergen-Paap)		4459.6		

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: V-Dem legislative corruption. FE IV model uses first and second lag of % women in the lower house as excluded instruments. System and Difference DPD models use all available exogenous lags as instruments. Standard errors are clustered by country.

Table 10: Difference-in-difference estimates for the effect of legislative gender quotas on corruption in the legislature

	FE	FE IV	FE 90	FE IV 90
presence of legislated quota	-0.0970	-0.118	-0.323***	-0.373***
	(-1.24)	(-1.48)	(-4.39)	(-4.54)
Observations	4458	4136	437	407
Countries	174	173	33	32
Years	27	25	27	25
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Hansen's J		0.000272		1.051
Hansen's J p-value		0.987		0.305
1st stage F-stat (Kleibergen-Paap)		7552.3		235.7

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: V-Dem legislative corruption. FE IV models use first and second lag of % women in the lower house as excluded instruments. Standard errors are clustered by country.