Women's political empowerment: Influence of women in legislative versus executive branches in the fight against corruption

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Abstract

This research adds to the literature on gender and corruption, with the main contributions lying in the comparison of the relative influence of women in the legislative versus the executive branches of the government on cross-country corruption. Placing the empirical analysis within the context of the determinants of corruption, results, using data over a large sample of nations covering the years 2018–2020, show that it is women in the legislative branch (via membership in parliaments) that exert a downward pressure on corruption. On the other hand, women in the executive branch (captured via female heads of state and female cabinet ministers) did not exert a statistically significant influence on corruption. Such insignificance also held when an overall index of women's political empowerment was used and with respect to the longevity of women's suffrage in a nation. Interestingly, nations with quotas for women's political participation experienced greater corruption. Our quantile regression results uniquely show the sensitivity of the prevalence of corruption to the factors driving it. These findings provide additional insights into the role of women in government - women across the board in government will not necessarily lead to a "cleaner" government, and that, the institution of quotas to bolster women's participation in the political process is not advisable, at least when corruption reduction is a goal.
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1. Introduction

With women's suffrage coming of age in most nations, along with globalization, aided by rapid technologies of information dissemination, there has been an increased focus on gender equality around the world. In fact, gender equality is one of the sustainable development goals outlined by the United Nations (https://www.un.org/sustainabledevelopment/gender-equality/), and emphasized by other international organizations (https://www.unicef.org/gender-equality; https://www.gatesfoundation.org/our-work/programs/gender-equality/gender-equality). The efforts towards this equality have encompassed economic, social, and political spheres, although significant differences, rooted often in culture and religion, remain across nations.[1] Thus, the task of policymakers to facilitate/institutionalize equality across genders remains unfinished.

Within these broad considerations and recognition of gender inequality, gender differences in politics and the need for better representation of women in government have been widely recognized and promoted. Globally, the United Nations Population Fund, has identified women empowerment as an important issue (Issue 7), and section 4.4 states that "Countries should act to empower women and should take steps to eliminate inequalities between men and women as soon as possible."[2] Among other things, they call for "[e]stablishing mechanisms for women's equal participation and equitable representation at all levels of the political process and public life in each community and society and enabling women to articulate their concerns and needs."[3] Furthermore, the United Nations' sustainable development goal 5.5, target 5.5, states that, "5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life".[4] In the United States, Women in Government (https://womeningovernment.org/) is an organization that seeks to empower and facilitate women state legislators across different states.

One strategy that more nations have turned to increase women's representation in the legislative process is gender quotas.[5] A quota system generally comes in one of three forms: (1). reserved seats in the legislature, (2). legal candidate quotas, and (3). voluntary political party quotas. For each of these systems, women must comprise a specified percentage of the group subject to the quota, with the goal that they achieve at least a "critical minority", typically in the range of 30–40 %.[6] Responsibility to achieve the quota rests on those who are charged with the recruitment process. At the time of this writing, over 50 % of all countries globally have adopted some form of quota system in parliamentary elections. How well quota systems work in achieving intended objectives is unclear as problems of their implementation have been noted in at least some countries.[7]

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[1] See https://www.pewresearch.org/global/2020/04/30/worldwide-optimism-about-future-of-gender-equality-even-as-many-see-advantages-for-men/; https://eige.europa.eu/gender-equality-index/2021.

[2] https://www.unfpa.org/resources/issue-7-women-empowerment.

[3] For up-to-date on data on women's participation in government across nations globally, see https://data.oecd.org/inequality/women-in-politics.htm and https://www.unwomen.org/en/what-we-do/leadership-and-political-participation/facts-and-figures.

[4] https://www.un.org/sustainabledevelopment/gender-equality/.

[5] The following description of quota systems is drawn from the International Institute for Democracy and Electoral Assistance (https://www.idea.int/data-tools/data/gender-quotas/quotas).

[6] Quota systems may also apply to other minority and ethnic groups. Attention here is given to quota systems that are focused on gender.

[7] https://www.idea.int/data-tools/data/gender-quotas/quotas#work

All this points to the importance of devoting attention to gender equality in politics and government, and this paper provides a formal analysis with respect to the impact on corruption. A part of the reason for women's relatively lower representation in the government might be rooted in history (e.g., when they were allowed to vote in their respective nations). We account for this in our analysis below.

Academics from different social science disciplines have tried to inform the gender empowerment debate, with initial investigations aimed at how to facilitate gender equality.[8] Over time, the focus has also shifted to the effects of the empowerment of women along various dimensions (Cuberes & Teignier, 2014; Duflo, 2012), and it is to this aspect that the present research is directed. Specifically, this paper examines the effects of the political empowerment of women, particularly, greater participation of women in the government, and compares their relative influences in the legislative versus executive branches on cross-national corruption in a large sample of nations. The corruption-gender angle cannot be claimed as a new angle, with Swamy et al. (2001) being an early and well-cited formal empirical investigation. However, along with an updated dataset consisting of a large sample of nations, we add a number of novel dimensions of the nexus between female empowerment and political corruption. First, the legislative-executive branch comparison, and the consideration of the role of enforcement are key contributions to the extant literature that make the related analysis more realistic, better grounded in intuition/theory, and thus better able to inform related policy. For instance, the legislative versus executive branch distinction in this context can address petty versus grand corruption, with legislatures better equipped to institutionalize grand corruption by writing/passing nations' laws. To the extent legislative bodies differ across nations, for example, across parliamentary and presidential systems of government, our research will also address the broader question of whether the type of electoral system matters in the gender and corruption context.

Further, the role of the government is crucial, with its role as the generator of rents on the one hand, and an enforcer of laws on the other hand, (Rose-Ackerman, 1999). Moreover, government officials can be involved in both petty and grand corruption.[9]

Beyond the participation in legislative/executive branches, there could also be differences across government officials depending upon whether they are elected or appointed. Elected officials are more directly answerable to the public, and one would expect this accountability to act as a corruption deterrent (although there could be fraud/corruption in elections (Goel and Mazhar, 2015)). On the other hand, political/government appointments can often ignore meritocracy and due process, and be subject to graft and nepotism. While these distinctions are present across gender, the willingness to participate in corrupt acts (seek and impart undue favors) might differ across gender (Goel and Nelson, 2021c).

Beyond these issues, we also explore possible connections between gender quota systems and corruption. While quota systems might lead to greater participation of women in the legislature (and thereby indirectly deter corruption), the record of such systems in that regard is inconclusive based on the extant literature. Further, the implementation and operationalization

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[8] Gans-Morse et al. (2018) note the challenges and opportunities in global corruption control.

[9] In practice, grand corruption episodes are few and materialize over time as laws and regulations changed to the preferences of the bribing agents. As such, and given that petty corruption occurrences are quite frequent and some of these may be intertwined with grand corruption episodes, empirically capturing petty and grand corruption across nations remains a challenge. The available cross-national corruption indices, like the one used in this paper, can be viewed as capturing perceptions about the prevalence of overall corruption.

of such quotas may also be associated with nepotism and graft, and thereby contribute to the incidence of corruption.

To summarize, three key questions addressed in the present research are the following:

- Do women in the legislative and executive branches of the government exert a similar influence on corruption as men?
- Is corruption in the least corrupt and most corrupt nations similarly impacted by women in government?
- Do gender quota systems (as presently constituted) have the unintended consequence of promoting corrupt activity in the public sector?

A comparison of the effectiveness of gender composition of the branches of government is lacking in the literature. Thus, besides adding to the literature, the findings would be instructive for anti-corruption policy formulation. Further, the answer to the second question will inform whether corruption control policies should be uniform across nations (Billger & Goel, 2009).

Whereas a number of studies on gender and corruption have found that a greater share of females in the government to lead to lower corruption (e.g., Swamy et al., 2001), these findings are not supported across the board. Furthermore, the structure of the government in a nation might itself influence the prevalence of corruption (Goel & Nelson, 2021b). In our analysis, if it turns out that females serving in different roles within the branches of government do indeed have different impacts on corrupt activity, then anti-corruption policies can be tailored more specifically. A noteworthy finding would be if females in government are relatively more (less) effective at curbing grand corruption (as opposed to petty corruption). This finding would add not only to the gender-corruption literature, but to the overall literature on the determinants of corrupt activities.

The findings will also contribute to broader policies related to female empowerment. For now, the extant literature on gender and corruption lacks consensus regarding whether greater participation of women in government (executive and/or legislative branches of the government) necessarily reduces corruption in all instances.

To our knowledge, the exploration of any nexus between gender quota systems and corruption has not heretofore been explored in the literature. Our findings are best viewed as a preliminary effort to fill that gap as we only look at gender quota systems viewed wholistically and do not consider differences in the institutional details of these systems across nations. Nevertheless, our results will shed light as to whether possible corruption spillovers from such strategies to enhance women in the political process should be a matter of policy concern.

The structure of the rest of the paper includes motivation and the model in the next section, followed by data and estimation, results, and conclusions.

2. Motivation and the model

2.1. Motivation

Whereas the broader literature on the empirical determinants of cross-country corruption has likely become overcrowded/saturated in recent years (see Dimant & Tosato, 2018), the subset of the literature on the gender-corruption nexus is smaller, and arguably in relative infancy. It is to this subset of the literature that the present research attempts to contribute, with a key novelty lying in examining the relative influence of women in legislature versus executive branches of

the government on corrupt activities. As we will demonstrate below, this consideration also enables us to address the relative influences on petty versus grand corruption, with legislatures having a greater influence in altering laws to impact (institutionalize) grand corruption.

In addition to the focus on the determinants of corruption per se, a stream of the literature considers the drivers of corruption perceptions and experiences (e.g., Belousova et al., 2016). This subset of the literature involves a few studies that address related gender differences in corruption perceptions/experiences (Bauhr & Charron, 2020; Goel & Nelson, 2021c).

The broader literature on the behavioral differences across gender considers underlying differences with respect to competitiveness attitudes and risk-taking (Booth & Nolen, 2012; Brandts et al., 2021; Städter et al, 2022). For example, males are generally considered to be more competitive than females (Barber & Odean, 2001; Buser et al., 2014). If it is indeed the case that males are more competitive, then they would have higher discount rates or impatience to steer outcomes in their favor.[10] Consequently, in the context of corruption, this greater impatience would translate into a greater eagerness to demand and offer bribes by males.[11]

Over time, different scholars have considered other dimensions of the gender-corruption nexus, dealing with the role of culture and institutions (Debski et al., 2018; Esarey & Chirillo, 2013; Stensöta et al., 2015). More recently, researchers have started to consider experiments to further examine the gender-corruption nexus (Alatas et al., 2009; Frank et al., 2011; Rivas, 2013).

In the present research, we examine different aspects of gender influences by considering different governmental roles of women as (less eager) demanders of bribes.[12] Are women in various leadership roles in the government (or women who have broken the political glass ceiling) equally likely to be averse to corrupt acts?

As political rights are equally conferred across populations (via suffrage and positions of women in the government), these can impact corruption (Neudorfer, 2015). This can happen, for instance, by altering the competition among bribe takers and bribe givers, besides different attitudes towards competitiveness and participation in illegal activities across gender.

The literature on gender and corruption is relatively new, starting formally with the paper by Swamy et al. (2001), where they found that, with micro-data, women are less involved in bribery, and are less likely to condone bribe-taking. Further, their cross-country data show that corruption is less severe where women hold a larger share of parliamentary seats and senior positions in the government bureaucracy.

A number of studies have found greater female participation in parliaments government to reduce corruption (Forgues-Puccio & Lauw, 2021; Jha & Sarangi, 2018; Rivas, 2013; Swamy et al., 2001),[13] while some others have cast doubts on the stability of this relationship (Alhassan-Alolo, 2007; Esarey & Chirillo, 2013; Frank et al., 2011). A recent experimental study by Guerra and Zhuravleva (2022) notes that neither males nor females might be more tolerant of corruption and that the context is important.

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[10] This idea could be placed in the context of Becker's (1968) notion of lawbreakers weighing the relative costs and benefits of their actions, and, in regard to the paper, the relative costs and benefits could vary across gender.

[11] The idea of women being averse to corruption finds support in Torgler and Valev's (2010) analysis of 8 European nations.

[12] Also, see Ryvkin and Serra (2020) on bureaucratic competition and corruption. This study, however, does not focus on gender differences.

[13] At the municipal level, Brollo and Troiano (2016) find that female mayors in Brazil were less likely to engage in corruption.

One qualitative difference between the executive and legislative branches of the government as it relates to corruption is that the general public (i.e., potential bribe givers) has relatively limited direct access to officials in the executive branch (relative to those in the legislative branch). In other words, an individual may have relatively greater/easier access to her congresspersons' office, than to a government minister. This access underlies the formation of corrupt contracts (Lambsdorff and Teksoz, 2005). Another layer to this dynamic is added when gender effects are introduced, with certain cultures limiting the free movement of women, impacting their roles as potential bribe givers and bribe takers.

Along another dimension, the present research can be seen as adding to the literature on the causes of corruption, an area where empirical research has blossomed in the past few decades (Dimant & Tosato, 2018; Goel & Nelson, 2010, 2021b; Serra, 2006; Treisman, 2000). With the multi-dimensional causes and effects of corruption, the literature has considered many influences on corruption, although not all of them have stood up to sensitivity analyses (Serra, 2006). This literature will inform us about the set of control variables that we will employ in our analysis, keeping the main thrust of this work on the role of women in government in mind.

In summary, in spite of a number of studies on gender and corruption (e.g., Jha & Sarangi, 2018; Sung, 2003; Swamy et al. 2001), there seems to be a lack of consensus on the influence of gender on corruption, with the underlying relation often resting in the context considered/ analyzed. The present study will contribute to this debate, besides adding some unique angles mentioned above. As different nations and international bodies are giving increased attention to women empowerment and gender equality, it seems useful to formally analyze and compare the spillovers from women's participation in different government bodies on corrupt activities. The formal general empirical model follows.

2.2. Model

Based on the above discussion and the focus on the main theme of the paper, the general form of the estimation equation is the following (with observations in the underlying data at the country and year level; see Table 1 for details):

CORR = f(*WomenPARL, FemaleHEAD, FemaleMINISTER, FemalePOLempower, Fem-QUOTA, SUFFRAGE*, Z, Regional dummy),   (1)

where Z = *GDPpc, GovtSIZE, RuleLAW, POPdensity, Presidential*.

The dependent variable (*CORR*) is the Corruption Perceptions Index (CPI) from Transparency International. This index, although not perfect (see Donchev & Ujhelyi, 2014), has, for a number of years, provided relative scores for countries on the perceptions of prevailing corruption.[14] Since 2012, the time series comparability of the index scores has improved, making it relatively more useful for our analysis that deals with more recent years (for details, see https://www.transparency.org/en/cpi/2021).[15] The index ranges from 0 to 100, with the sample mean of 53.9, and shows considerable variation across countries (12–81 in our sample).

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[14] For ease of interpretation, the raw index was rescaled in our analysis so that higher numbers represent greater corruption.

[15] There may be gender differences in the perceptions of corruption (Bauhr & Charron, 2020; Goel & Nelson, 2021c). However, time series cross-national data on corruption perceptions broken down by gender are unavailable, to the best of our knowledge.

Table 1
Variable definitions, summary statistics, and data sources.

Variable	Mean (standard deviation)	Source
Corruption Perceptions Index, 2021: (0 – 100, where higher values imply greater perceived corruption in the public sector, according to experts and businesspeople) [*CORR*]	53.90 (18.49)	[1]
Women in Parliament Index - Mean value over the years 2018, 2020, 2021: (0 – 1, where 1 represents parity with men) [*womenPARL*]	0.36 (0.22)	[2]
Women in Ministerial Positions Index - Mean value over the years 2018, 2020, 2021: (0 – 1, where 1 represents parity with men) [*femaleMINISTER*]	0.33 (0.24)	[2]
Years with female head of state (last 50) - Mean value over the years 2018, 2020, 2021: (0 – 1, where 1 represents parity with men) [*femaleHEAD*]	0.08 (0.16)	[2]
Global Gender Gap Political Empowerment Index - Mean value over the years 2018, 2020, 2021: (0 – 1, where 1 represents parity with men) [*FemalePOLempower*]	0.23 (0.14)	[2]
Suffrage: Number of years since women were granted the right to vote in general elections [*SUFFRAGE*]	71.63 (22.54)	[3]
Presidential systems: (=1 if yes, = 0 if a country has either a parliamentary system or assembly-elected president system since at least 2018) [*Presidential*]	0.56 (0.50)	[4]
Gender Quota: If there has been a gender quota system since at least 2018 to recruit women in political positions (i.e., reserved seat or candidate list) (=1 if yes, = 0 if no) [*FemQUOTA*]	0.74 (0.44)	[4]
Economic prosperity: GDP per capita, PPP (constant 2017 international $, in thousands) – Mean value over 2018, 2019, 2020 [*GDPpc*]	22.86 (21.89)	[5]
Government size: General government final consumption expenditure (% of GDP) – Mean value over 2018, 2019, 2020, [*GovtSIZE*]	16.29 (5.46)	[5]
Rule of Law: Perceptions of the extent in which agents have confidence in and abide by the rules of society, measured in standardized units ranging from − 2.5 to +2.5, with greater values implying stronger institutions – Mean value over 2018, 2019, 2020, [*RuleLAW*]	0.079 (0.95)	[6]
Population density (people per sq. km of land area), 2020 [*POPdensity*]	234.99 (745.24)	[7]

Notes: Statistics pertain to observations used in the first model that the variable appears.
Sources:
[1]. Transparency International. https://www.transparency.org/en/cpi/2021 (accessed July 2022).
[2]. World Economic Forum, Global Gender Gap Report. https://tcdata360.worldbank.org/indicators/af52ebe9?country=BRA&indicator=27962&viz=line_chart&years= 2006, 2021 (accessed July 2022 - data for 2019 were unavailable).
[3]. Paxton, P., Green, J., Hughes, M.M., 2008. Women in Parliament, 1945–2003: Cross-National Dataset. Inter-university Consortium for Political and Social Research [distributor], 2008–12-22. https://doi.org/10.3886/ICPSR24340.v1. Updated by authors to the present.
[4]. DPI2020 Database of Political Institutions. http://dx.doi.org/10.18235/0003049.
[5]. World Development Indicators (accessed July 2022).
[6]. Worldwide Governance Indicators. https://info.worldbank.org/governance/wgi/ (accessed August 2022).
[7]. World Development Indicators. https://databank.worldbank.org/source/world-development-indicators (accessed August 2022).

We consider several dimensions of the role of women in the government. First, the share of women in parliament (*womenPARL*; measured via an index (Table 1)) in the legislative branch of government is considered. Parliaments are entrusted with framing laws, and, in the context of

corruption, they could design/pass laws making certain kinds of corrupt activities legal (e.g., campaign contributions), make more stringent laws against corruption, and/or design laws that facilitate grand corruption by allowing greater opportunities of rent-generation by corruption politicians and government bureaucrats.

Two variables, *femaleHEAD* and *femaleMINISTER*, address the participation of women in the executive branch of the government. Heads of state can set the direction for nations, leading by personal example. They are also instrumental in choosing their cabinet, and together, they set (and facilitate) the legislative agenda. Corrupt heads of state, on the other hand, can make corruption more acceptable.[16] Cabinet ministers, depending upon the management style of the head of state and the nation's constitution, might have enough leeway in running their departments, including establishing an environment with respect to the permissiveness of engaging in corrupt behavior among subordinates. Within these distinctions, the gender behavioral differences discussed above can come into play, shaping the behavior of female heads and female ministers towards corruption. As noted earlier, some research has shown that there are gender differences in the setting of goals, and these differences vary across private and public goals (Brandts et al., 2021).

Tying to the theme of the paper, *womenPARL* captures the women in the legislative branch of the government, whereas *femaleHEAD* and *femaleMINISTER* capture the executive branch (see Table 1).[17] While some scholars have considered the role of women in parliament in the context of their impacts on corruption (e.g., Swamy et al., 2001), the comparison of their relative impacts from participation in the legislative and executive branches seems unique. Are women in the legislative branch of the government more (less) effective in curbing corruption than those in the executive branch? As discussed above, the legislative branches are more concerned with enacting and passing laws, while the executive branches are responsible for administering the laws. Given this distinction, the executive branch might be expected to relate more to the prevalence of petty corruption in a nation, while the legislative branch may relate more to grand corruption. Thus, women, with their behavioral differences from males, could very well have different impacts on corruption, depending upon whether they are in the legislative or the executive branch.

As an overall indicator of women's empowerment in the political arena of a nation, we include a related index, *FemalePOLempower*. This index can be seen as a broad measure of political empowerment, capturing women in both the legislative and executive branches of the government. Finally, *SUFFRAGE*, accounting for the years since women in a nation were granted the right to vote, captures women's familiarity and learning with the democratic processes in their nations (also see Wells, 1929). Women's right to vote would be expected to act as a corruption deterrent when they can vote corrupt officials out of office.

The participation of women in government might be facilitated in certain nations via quotas (including quotas for parliament and/or political party bodies - see, for example, Ordine et al.,

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[16] A recent instance is related to the former President Zuma of South Africa (https://www.washingtonpost.com/world/2022/06/22/south-africa-corruption-zuma-gupta/; https://www.reuters.com/world/africa/south-africas-zuma-suffersnew-setback-corruption-trial-2022–05–26/).

[17] Of course, there may be some nations where women are in prominent leadership positions in both the branches of the government. We account for this in some of the models estimated. Also, as the reader would notice, we do not control for the influence of women in the judiciary. Besides a lack of corresponding data, another reason for this omission is that judges in some nations, at some levels at least, are elected, while all judges in other nations are appointed (and this difference does not seem directly tied to presidential-parliamentary system distinction).

2023, regarding evidence from Italian municipalities). To account for this, we include a variable, *FemQUOTA*, identifying nations with quotas for females in government. The underlying motives for gender quotas can be viewed within the broad realm of gender equality (see Bush, 2011). As noted in the introduction, many nations have enacted or are considering enacting gender quota legislations for elections as part of overall female empowerment initiatives. In the present context, quotas can also contribute to corruption when they lead to nepotism and graft; on the other hand, quotas can facilitate the formation of a "critical mass" of female parliamentarians to act as an effective counterweight.[18]

The set of controls (denoted by the vector Z in equation (1)), nested in the literature on the determinants of cross-country corruption (Serra, 2006; Treisman, 2000), include *GDPpc* (capturing economic prosperity), *GovtSIZE*, an index of the rule of law (*RuleLAW*), population density (*POPdensity*), and an indicator variable identifying countries with presidential systems of government (*Presidential*). Greater economic prosperity has been shown to lower corruption (Lalountas et al., 2011; Serra, 2006), the underlying argument being that there is a greater opportunity cost of breaking the law in rich nations (also see, An and Kweon, 2017; Goel and Rich, 1989), along with such nations having better checks and balances, ceteris paribus. Larger government sizes might be associated with greater rent-seeking and rent-generating potential on the one hand, while larger governments might also have larger enforcement departments (Goel and Nelson, 1998; Rose-Ackerman, 1999). Another dimension of government involvement, through its role in framing and maintaining institutions, is accounted for by including an index of the rule of law (*RuleLAW*). A strengthened rule of law signals higher costs of engaging in illegal acts, and would be expected to lower corruption (Capasso et al., 2019; also see Sharma & Mitra, 2015).

Corrupt exchanges between bribe-takers and bribe-givers are facilitated when transaction costs associated with corrupt deals are relatively low (Goel, 2013). We include a nation's population density to capture the networking effects. It is also possible, however, that corruption may be lower in densely populated areas when bystanders act as informal watchdogs.

Institutional arrangements across political systems are not all alike, with a key qualitative distinction being between parliamentary and presidential systems of government (Carey, 2008; Ganghof, 2015; Goel & Nelson, 2020; Horowitz, 1990; Kaminsky, 1997; Moe & Caldwell, 1994).[19] Accordingly, we include a dummy variable identifying presidential systems (*Presidential*) as a control variable in our model setup. Presidential systems are less prone to midterm elections and therefore tend to be more politically stable. In the context of corruption, the relative stability of presidential systems can impact the expected costs/benefits and the longevity of corrupt contracts. Another key distinction is that cabinet ministers in presidential systems, unlike their parliamentary counterparts, do not necessarily have to be elected members of the parliament (see Kaminsky, 1997; Klüser & Breunig, 2022; Mitchell, 2000; Moe & Caldwell, 1994; Siaroff, 2003; Strøm, 2000). Given the focus of this study on the relative

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[18] As an additional refinement, we considered a stronger classification by coding the quota variable to identify nations with quotas for women seats in the legislature or required candidate lists or party slates ("voluntary" party quotas excluded). The resulting coefficient was insignificant and further details are available upon request. Theoretically, with quotas tied to graft and nepotism promoting rent-generating activities, the broader classification that we use (i.e., *FemQUOTA*) seems more relevant for its ties to corruption.

[19] The consideration of parliamentary versus presidential systems is part of the wider idea about the role of political institutions in corruption (Goel & Nelson, 2021b; Lederman et al., 2005; Mitchell, 2000; Moe & Caldwell, 1994; Moe, 1990; Strøm, 2000).

impacts of women in government on corruption, the control for institutional differences across nations is pertinent, and somewhat unique in the literature focusing on the gender-corruption nexus.[20]

Finally, we include regional dummies to control for potential (geographic) influences on corruption that are not otherwise captured in the set of other control variables. Next, we turn to a discussion of the data employed and the estimation strategy to estimate Eq. (1).

3. Data and estimation

3.1. Data

Our dependent variable is the corruption perceptions index from the Transparency International (*CORR*). Despite the well-known issues with accurately capturing the prevalence of corruption (Donchev & Ujhelyi, 2014), this index has been widely used in the empirical literature on the causes and effects of cross-national corruption (see Dimant & Tosato, 2018). In our sample, Burundi and the Democratic Republic of Congo were assessed as the most corrupt nations (index value of 81), while New Zealand, Finland, and Denmark were the cleanest nations (index value of 12).

As noted above, given its multi-dimensional nature, the measurement of gender inequality is not a trivial matter, and this aspect has received some attention in the literature (Beneria & Permanyer, 2010). We address the issue by employing alternative dimensions, drawn from several sources. First, we consider four measures of female representation in government that are taken from the Global Gender Gap Index data set published under the auspices of The World Bank. Women's participation in the parliament (legislative) branch of government is captured by the *womenPARL* Index, which takes on values ranging from 0 (imparity) to 1 (full gender parity). In our data set the value of this Index ranged from a full parity (Rwanda) to a low of 0.16 (Oman), with a mean value of 0.36.

Women's representation in the ministerial positions of government is measured by an index defined similarly, *femaleMINISTER*. During the time period of our analysis, women ministers in France, Canada, Nicaragua, and Sweden had full parity with men. In contrast, Saudi Arabia and Azerbaijan had no women in ministerial positions. The mean value for the full data set for this index stood at 0.33.

Further, an index reflecting gender equality regarding female heads of state over the past 50 years, *femaleHEAD*, had a mean value of only 0.08 in our data set. There were no female heads of state during this time period for over half of the countries we considered in our analysis. In contrast, Bangladesh stood out with nearly full gender parity (0.99).[21]

Finally, we also consider *FemalePOLempower*, an overall index of female political empowerment that is calculated as a weighted average of the parliamentary, ministerial, and head-of-state indices. In our sample, Iceland had the highest score on overall female political

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[20] Swamy et al. (2001) also considered the share of women ministers. A key limitation of Swamy et al.'s paper is that it does not control for the potential benefit and enforcement sides of corruption by ignoring the role of the government through government outlays and/or other enforcement. In another related work, Jha and Sarangi (2018), besides the share of women parliamentarians, consider women in clerical positions and in decision-making positions in a sample of 17 European nations.

[21] In our sample, the correlation between *womenPARL* and *femaleMINISTER* was 0.66; and for *womenPARL* and *femaleHEAD* the correlation was 0.11.

empowerment (0.712), while Oman had the lowest score (0.027). The corresponding mean value for the entire data set stood at 0.23.

Beyond the four female empowerment measures, we also considered two related variables pertaining to women's participation in the political process, voting rights (*SUFFRAGE*) and gender quotas (*FemQUOTA*). The average number of years since women were granted the right to vote in general elections is about 72 years in our data set. In our analysis, a country was deemed to have some form of gender quota system to recruit women in the legislative branch of government, with no distinction made between required and voluntary gender quotas. Nearly three-quarters of the nations in our data set had some type of gender quota system by 2018.

Data on systems of government (presidential versus parliamentary) were drawn from the Database of Political Institutions. Countries categorized as "Assembly-elected President" in the data set were also considered to be parliamentary systems in the analysis below. Fifty-six percent of sample nations were classified as presidential systems.

The remainder of the data pertaining to country-level control variables are drawn from reputed international sources that are routinely used in the extant literature. Details about all the variables in the analysis, including definitions, summary statistics, and data sources are provided in Table 1. The time span of our sample (covering the years 2018–2020) is limited by the availability of consistent cross-country data on women's participation at various branches of government.[22] Table A1 in the Appendix provides the correlation matrix of key variables in the analysis. The correlation between *womenPARL* and *femaleMINISTER* was 0.66, while that between *womenPARL* and *FemQUOTA* was 0.31. A discussion of our estimation procedure follows.

3.2. Estimation

We employ different estimation techniques to test the validity of our findings and to focus on the aspect being emphasized in our study. First, we use OLS regressions in Tables 2 and 3, and report the significance of estimated coefficients using robust standard errors.[23] Second, we use quantile regression in Table 4 to test whether the influence of women in government varies across the least and most corrupt nations (see Koenker & Hallock, 2001 for background on the quantile regression). This enables us to address issues of underlying non-linearities in the relationship between the dependent and independent variables (see Billger & Goel, 2009).

4. Results

Our estimation results, using variations of the general model in Eq. (1) are presented in Tables 2 and 3.

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[22] The latest sample year (2020) would have some pandemic-related shocks. However, this would be less of a concern with (limited) changes in the composition of governments.

[23] Note that government elections are periodic, and therefore, reverse causality from corruption to government office seems less of a concern. Still, to address this possibility, we include a one-period lagged value of the regressors in the models estimated.

Table 2
Women in government and corruption: Baseline models.

Dependent variable: Corruption Perceptions [CORR]								
Model →	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
Women in Parliament [*womenPARL*]	**-5.330** (2.2)**						**-5.615** (2.3)**	
Women in Ministerial Positions [*femaleMINISTER*]		-0.150 (0.6)				-1.537 (0.6)		
Female Head of State [*femaleHEAD*]			3.374 (1.2)	-3.552 (0.7)		3.401 (1.2)	4.177 (1.4)	2.340 (0.9)
Gender Political Empowerment [*FemalePOLempower*]								
Gender Quota [*FemQUOTA*]					2.837** (2.2)			2.791** (2.2)
Country-level control variables								
Presidential system [*Presidential*]	0.260 (0.2)	0.291 (0.2)	0.482 (0.3)	0.240 (0.2)	0.307 (0.2)	0.417 (0.3)	0.412 (0.3)	0.477 (0.3)
Economic prosperity [*GDPpc*]	-0.092** (2.4)	-0.094** (2.4)	-0.093** (2.3)	-0.092** (2.3)	-0.086** (2.3)	-0.096** (2.4)	-0.094** (2.3)	-0.088** (2.3)
Government Size [*GovtSIZE*]	-0.095 (1.1)	-0.123 (1.5)	-0.119 (1.4)	-0.122 (1.4)	-0.179** (2.1)	-0.114 (1.4)	-0.083 (1.0)	-0.170** (2.0)
Rule of Law [*RuleLAW*]	-16.900** (15.4)	-16.990** (14.8)	-17.319** (15.4)	-16.944** (14.5)	-17.167** (15.5)	-17.127** (14.6)	-17.054** (15.2)	-17.334** (15.2)
Population density [*POPdensity*]	0.000 (0.3)	0.000 (0.4)	0.000 (0.5)	0.000 (0.3)	0.001 (0.7)	0.000 (0.4)	0.000 (0.4)	0.001 (0.8)
Continental fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	134	134	134	134	133	134	134	132
F-statistic	220.03**	246.64**	205.37**	226.60**	172.19**	232.76**	201.56**	154.71**
R-squared	0.92	0.92	0.92	0.92	0.93	0.92	0.92	0.93

Notes: Variable definitions are provided in Table 1. All models are estimated via ordinary least squares and include a constant term (not reported). Continental effects (not reported) include East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia, and Sub-Saharan Africa. The numbers in parentheses are (absolute value) z-statistics based on robust standard errors. * denotes statistical significance at the 10 % level, and ** at 5 % level (or better).

Table 3

Women in government and corruption: Extended models.

Dependent variable: Corruption Perceptions [*CORR*]				
Model →	2.1	2.2	2.3	2.4
Women in Parliament [*womenPARL*]	**-5.461** (2.2)			
Women in Ministerial Positions [*femaleMINISTER*]		**-1.530 (0.6)**		
Female Head of State [*femaleHEAD*]			3.685 (1.3)	
Gender Quota [*FemQUOTA*]				**2.825** (2.2)
Suffrage [*SUFFRAGE*]	-0.009 (0.3)	-0.011 (0.4)	-0.015 (0.5)	-0.002 (0.1)
Country-level control variables				
Presidential system [*Presidential*]	0.349 (0.2)	0.353 (0.2)	0.580 (0.4)	0.331 (0.2)
Economic prosperity [*GDPpc*]	-0.093** (2.3)	-0.097** (2.3)	-0.097** (2.3)	-0.086** (2.2)
Government Size [*GovtSIZE*]	-0.094 (1.1)	-0.124 (1.4)	-0.120 (1.4)	-0.178** (2.1)
Rule of Law [*RuleLAW*]	-16.828** (15.1)	-16.918** (14.5)	-17.241** (15.2)	-17.150** (15.3)
Population density [*POPdensity*]	0.000 (0.4)	0.000 (0.4)	0.000 (0.5)	0.000 (0.7)
Continental fixed effects	Yes	Yes	Yes	Yes
Observations	133	133	133	132
F-statistic	192.96**	198.46**	168.10**	156.92**
R-squared	0.92	0.92	0.92	0.93

Notes: See Table 2.

Table 4

Women in government and corruption: Quantile regression.

Dependent variable: Corruption Perceptions [*CORR*]			
Quantile →	q25	q50	q75
Women in Parliament [*womenPARL*]	**-6.068* (1.9)**	**-7.644** (2.5)**	**-5.461* (1.8)**
Country-level control variables			
Presidential system [*Presidential*]	0.325 (0.1)	-1.308 (0.9)	0.759 (0.5)
Economic prosperity [*GDPpc*]	-0.038 (0.6)	-0.111** (2.1)	-0.129** (2.1)
Government Size [*GovtSIZE*]	-0.065 (0.4)	-0.092 (0.7)	-0.077 (0.5)
Rule of Law [*RuleLAW*]	-18.047** (12.1)	-17.086** (10.9)	-15.549** (10.9)
Population density [*POPdensity*]	0.000 (0.0)	0.000 (0.1)	0.003 (1.2)
Continental fixed effects	Yes	Yes	Yes
Observations	134		
Pseudo R-squared	0.76	0.75	0.72

Notes: Variable definitions are provided in Table 1. All models include continental fixed effects (not reported to conserve space). q50 denotes the median regression. Absolute value of t-statistics is in parentheses based on bootstrapped standard errors (200 replications). * denotes statistical significance at the 10 % level; and ** at 5 % level (or better).

4.1. Baseline models

Among the set of different aspects of women in government, we find that women in parliament (*womenPARL*) reduced corruption. This is consistent with females being less competitive, more clean, or with their relative lack of networking to effectively forge corrupt relations (see Stoecker, 2022). Numerically, a ten percent increase in the share of women in parliament reduces corruption activity by 0.4 % (Model 1.1).[24] While the role of women in parliament has been considered elsewhere in relation to their impact on corruption (Swamy et al., 2001), our study uniquely compares this effect to that of women in the executive branch and explicitly controls for the role of government and enforcement, while also making allowance for the possible nuances between presidential and parliamentary institutional regimes.

The finding of women being less corrupt can also be seen in the context of risk attitudes across gender, with women being relatively more risk averse (see, for example, Comeig et al., 2022). With corruption being a risky activity, with the potential risk of punishment upon being caught (Becker, 1968), and even with uncertain payoffs, our results show that risk-averse females are less likely to engage in corrupt activities.

Nations with female heads of state and those with female ministers in the cabinet were no different from others with regard to corruption prevalence. While the risk attitudes discussed above still apply to female heads of state and ministers, their actions are under greater public and media scrutiny, making them less likely to stand out and differ from their other (male) colleagues. On the other hand, many (most) votes of parliamentarians are secret ballots, emboldening them to vote their true beliefs. This insignificance (of the estimated coefficients) also held with respect to an overall index of women's political empowerment (*FemalePOLempower*) in Model 1.4.

Interestingly, nations' employing some form of (mandatory or voluntary) female quota for participation in the legislative branch of government (*FemQUOTA*) exhibited higher levels of corruption (Models 1.5 and 1.8). Results for these models show that the implementation of a quota system is associated with nearly a 3-point increase in the Corruption Perceptions Index, other things being equal. This suggests that while quotas may contribute to greater participation in the legislative process and indirectly deter corruption, the implementation of such quotas may also be associated with greater nepotism and graft and higher levels of corruption related to such activities.

As an additional consideration, in Models 1.6–1.8, we also consider adding *femaleHEAD* to models with *womenPARL*, *femaleMINISTER*, and *FemQUOTA*. The idea is that some of these factors are not necessarily mutually exclusive - e.g., a nation could have a female head of state along with female cabinet ministers. The findings remain unchanged, with only *womenPARL* and *FemQUOTA* being significant, and preserving their previous signs and magnitudes.

The results for the other controls are consistent with the extant literature.[25] Specifically, greater economic prosperity in a nation, and nations with a strengthened rule of law experienced lower corruption, while the effects of population density and government size were statistically

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[24] The corresponding elasticity, evaluated at sample means, is -0.04. Appropriate caution should be used in interpreting elasticities when the underlying variables are measured in indices (see Table 1).

[25] For brevity in exposition, the results of individual regional coefficients are not presented, but are available upon request.

insignificant.[26] Finally, nations that were presidential systems of government were no different from others.

4.2. Additional considerations: accounting for the role of suffrage

Table 3 replicates the models in Table 2 by adding *SUFFRAGE* as an additional regressor. The years since women's right to vote in a nation is a dimension that captures women's empowerment in the political sphere as well as learning and familiarity with the democratic process. The political equality via suffrage can act as a corruption deterrent when the threat of voting by females discourages some elected officials from corrupt practices and promotes greater representation in the various institutions of government. The sign of *SUFFRAGE* is negative and consistent with the corruption-deterring effect. However, the coefficient fails to attain statistical significance at the usual levels of significance.

The results for the other variables in the model are similar to what was reported in Table 2. Next, we address another related question, and for that, we employ an alternative estimation strategy.

4.3. Comparing the influence of women in government in the least and most corrupt nations: Quantile regression

Given that *womenPARL* variable is consistently statistically significant in Tables 2 and 3, it seems useful to study whether the least corrupt and most corrupt nations are equally impacted by changes in women's participation in parliament.[27] For this purpose, we employ the quantile regression and present the corresponding results in Table 4. The quantile regression enables us to answer whether the most corrupt and the space least corrupt nations are equally impacted by changes in the share of women in parliament (for background, see Koenker & Hallock, 2001).

The results, reported at q25 (least corrupt), q50 (median), and q75 (most corrupt), show that *womenPARL*, *GDPpc*, and *RuleLAW* remain statistically significant determinants across the distribution of corruption across nations in our sample. This supports the underlying main findings in Tables 2 and 3.

We further see that the influence of women in parliament is strongest in the median regression, both in terms of statistical significance and in relative magnitude. Understandably, the most corrupt nations (q75) were impacted relatively the least from *womenPARL*. Conversely, the negative impact of economic prosperity on corruption was relatively the greatest in the most corrupt nations, while the rule of law was least effective in such nations. These findings, while supporting our baseline results, underscore the importance of tailoring anti-corruption policies somewhat differently for the least and the most corrupt nations. The concluding section follows.

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[26] The size of the government can, however, potentially have a multitude of influences on corruption, both direct and indirect (Goel & Nelson, 2021b). The consideration of the different channels of the government's role is beyond the scope of the current study.

[27] Since *FemQUOTA* is a dichotomous variable (Table 1), it makes less sense to employ the quantile regression in this case.

5. Concluding remarks

In the quest to better inform policymakers on the effective ways to combat corruption, academics have been considering economic and social factors, and one social factor is the role of gender. This research adds to the literature on gender and corruption. The main contributions of this work relate to the comparison of the relative influence of women in the legislative versus the executive branches of the government on cross-country corruption.[28] We also offer some preliminary evidence regarding the overall effect of gender quotas on corruption. Furthermore, we consider whether women in government are equally effective at influencing corrupt activity in the least and the most corrupt nations.

As discussed in the Introduction, various national and international organizations have recognized the need for greater gender equality of representation in government, and many nations have adopted strategies such as gender quotas to affect such an outcome.[29] It is unclear, however, whether proponents of these measures recognized the (positive) spillovers of greater women's representation in government on corrupt activity and whether there were differences in the types of representation. This paper also provides some formal new international insights in this regard. It remains to be seen, however, whether greater globalization (Lalountas et al., 2011) and corruption contagion (Goel and Saunoris, 2022) would impact the influence of female government representatives on corrupt activities.

Placing the empirical analysis within the context of the empirical determinants of corruption (Dimant & Tosato, 2018; Goel & Nelson, 2010; Serra, 2006; Treisman, 2000), results, using data over a large sample of nations using a well-known and widely used cross-country measure of corruption perceptions for the year 2021, show that it is women in the legislative branch (via membership in parliaments) that exert a downward pressure on corruption. A possible explanation for this is the differential access the public has to officials in the legislative and executive branches of the government, as discussed above. Although data at a fine individual level is not available on the identity and participation in corrupt exchanges (Lambsdorff and Teksoz, 2005), this might provide some insights into the reason for the relatively insignificant impacts of women in executive positions. Obviously, this is an area for more detailed research in the future.

Furthermore, nations with a greater share of female parliamentarians experienced lower corruption, ceteris paribus. This finding holds across different modeling variations and when presidential systems are controlled for (separately from parliamentary systems of government). On the other hand, women in the executive branch (captured via female heads of state and female cabinet ministers) did not exert a statistically significant influence on corruption. These findings provide additional insights into the role of women in government - women across the board in government will not necessarily lead to a "cleaner" government.

It is important to acknowledge that a contributing factor behind these different findings between the legislative and executive branches of government may be the relatively slow progress that has been made in gender parity on the executive/administrative side of the political arena. While still well below parity with their male counterparts, women's participation in parliament has steadily

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[28] We are, however, unable to consider gender differences in the judicial branch of the government due to a lack of corresponding data across nations. Goel and Nelson (2007) consider the effects of judicial employment on corruption in the United States but do not consider gender differences.

[29] See https://www.unfpa.org/resources/issue-7-women-empowerment; https://www.un.org/sustainabledevelopment/gender-equality/; and https://womeningovernment.org/.

increased in many countries over recent decades, with a global average of women in parliament standing at 26.1 % in 2022 compared to only 11.3 % in 1995.[30] In contrast, while mean value for the Women in Ministerial Positions Index used in this analysis is only somewhat below that for the corresponding Parliament Index (Table 1), improvement in ministerial positions may have been much more recent based on the Global Gender Gap Report (2020).[31] Further, the Female Head of State Index was much lower (0.08) in our data set and, as noted above, there were no female heads of state anytime during the past 50 years for over half of the countries we considered in our analysis. Nevertheless, women's participation in government has shown improvement in all three areas in recent years so it will be important to revisit the analysis presented in this paper at an appropriate time in the future. Future studies should also focus on the influence of local female government officials on corruption at the local level (e.g., Brollo & Troiano, 2016). This would give insights into the drivers of petty corruption.

We find that the imposition of quotas appears to have a direct negative/adverse impact on corruption, perhaps due to greater nepotism and graft that might surround the execution of these strategies to promote greater gender equality in the legislative process.[32] Greater inclusion of females via quotas might also promote the induction of like-minded candidates or females with similar political beliefs into the government. This could facilitate the formation of corrupt networks, leading to greater corruption. This should inform politicians in some nations, where in order to shore up vote banks, quotas to different interest groups are offered. Legislating quotas for women can, however, be quite time-consuming - a case in point being India, the world's largest democracy.[33] This issue deserves further exploration as it was beyond the scope of the present research. In particular, the institutional details surrounding gender quotas vary considerably across nations, and it would be worthwhile to explore the possible impact of these differences on corrupt activity. Such an analysis should prove useful in informing public policy in tailoring female political empowerment measures such that they achieve their intended objectives while minimizing possible unintended consequences in terms of corruption. Our quantile regression results in Table 4 uniquely show the sensitivity of the prevalence of corruption to the factors driving it.

In terms of the policy significance of these findings, it is noteworthy that while political institutions are typically slow to change, there are numerous examples of such changes in recent decades (Goel & Nelson, 2021a; Hayo & Voigt, 2010; Robinson & Torvik, 2016; Wiatr, 1999).[34] The findings presented here also offer an important contribution to any policy debate as whether presidential or parliamentary regimes are more efficacious in carrying out the responsibilities of government and serving the best interest of its citizens. The policy insights from more prosperous nations and nations with a strengthened rule of law being less corrupt, while not new, are still instructive. Finally, any dividends from suffrage in terms of the impact

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[30] Some have argued that a 30 % threshold is necessary for women to have a policy impact in the legislature (https://www.ipu.org/resources/publications/reports/2022–03/women-in-parliament-in-2021).

[31] https://www3.weforum.org/docs/WEF_GGGR_2020.pdf

[32] For an alternate view regarding the advisability of quotas for gender equality, see https://www.oecd.org/gender/quotas-gender-equality.htm. Also, see Pande and Ford (2012).

[33] See https://www.brookings.edu/blog/up-front/2019/10/18/womens-reservation-bill-what-can-india-learn-from-other-countries/; https://www.aljazeera.com/news/2021/9/8/25-years-india-women-reservation-bill-elected-bodies-gender; https://thewire.in/women/indian-politics-has-a-clear-gender-imbalance-thats-why-we-need-the-womens-reservation-bill.

[34] Pakistan offers a recent example where there is debate on a possible switch from a parliamentary to a presidential system of government (https://www.dawn.com/news/1648853/sc-rejects-petitions-for-presidential-form-of-govt).

on corruption seem to have dissipated over time, suggesting the need for more direct policies to include more women in governmental decision-making roles.

Declarations of interest

None.

Appendix I. Correlation of key variables

	CORR	women-PARL	female-HEAD	femaleMINISTER	Fem-QUOTA	Presidential	SUFFRAGE
CORR	1.00						
womenPARL	-0.30	1.00					
femaleHEAD	-0.25	0.12	1.00				
femaleMINISTER	-0.38	0.66	0.07	1.00			
FemQUOTA	0.10	0.31	0.10	0.26	1.00		
Presidential	0.51	-0.11	-0.28	-0.21	-0.02	1.00	
SUFFRAGE	-0.25	0.14	0.24	0.14	0.00	-0.23	1.00

Notes: See Table 1 for variable definitions.

Appendix II. Countries in data set

Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burundi, Cabo Verde, Cambodia, Cameroon, Canada, Chad, Chile, China, Colombia, Congo (Dem. Rep.), Costa Rica, Cote d′Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea (Rep.), Kyrgyz Republic, Latvia, Lebanon, Lesotho, Lithuania, Luxembourg, Macedonia, Madagascar, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Zambia, Zimbabwe

Number of countries = 134

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