



Will Women's Representation Reduce Bribery? Trends in Corruption and Public Service Delivery Across European Regions

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Accepted: 13 February 2024
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Abstract

While a growing body of work suggests that women representatives are less likely to be involved in corruption scandals, we know less about if changes in representation patterns also have implications for citizens' first-hand experiences with corruption in public service delivery. This study suggests that women elected representatives reduce street level bribery, in particular when the share of women increases in contexts where relatively few women are elected or when the absolute increase in women's representation is relatively large. Using newly collected data on the share of women in 128 regional level parliaments in 10 European countries and four rounds of the European Quality of Government Index (EQI) survey (2010–2021), our two-way fixed effects models show that on average, the proportion of women in regional parliaments is strongly associated with citizens' self-reported experiences of bribery across all countries and years. Furthermore, our difference-in-difference design shows that the level of bribery in public service provision dropped more sharply in regions that experienced a greater absolute or greater marginal increase in women's representation. Our results may be understood in light of women candidates placing priority on well-functioning and low corrupt public service provision and the important signals of inclusiveness, non-discrimination and decreased tolerance towards corruption that women's representation conveys to civil servants.

Keywords Women's representation · Corruption · Bribery · Public service delivery · Marginalization · Risk aversion · Inclusiveness

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Introduction

Citizens encounter government institutions mainly through their interaction with street level service provider, such as doctors, teachers, or police officers. Almost 80% of citizens in Europe have had contact with at least one of these services in the last 12 month (see Charron, Lapuente & Bauhr, 2022). Street level bureaucrats are expected to act impartially and professional while still “differentiating their actions according to the specific needs of each and every case” (Rothstein & Varraich, 2017: p. 121). However, discretion also gives local service providers the leeway to obstruct goals of impartiality in exchange for preferential treatment or outright bribe payment. A growing body of work suggests that an increase in women’s representation will reduce overall levels of corruption (Dollar, Fisman, & Gatti, 2001; Swamy et al., 2001; Esarey & Schwindt-Bayer, 2018) as well as place a stronger priority on well-functioning public service provision more broadly (Ennsner-Jedenastik, 2017; Schwindt-Bayer, 2006). Few studies to date, however, explicitly investigate if women’s representation can reduce petty corruption as experienced first-hand by citizens in their interaction with public service providers, and thereby if women’s representation can have more profound implications for the functioning of the public sector.

This study investigates if and when women’s representation influence the level of petty corruption, i.e. bribery for public services that citizens encounter in their day to day interaction with street level service providers (Bauhr, Charron, & Wängnerud, 2019; Jha & Sarangi, 2018).¹ We suggest that women’s representation reduces bribery for public service provision, in particular in contexts that initially have few women elected and where increases in the share of women representatives are quite substantial. Much in line with studies on the link between descriptive and substantive representation we propose that this could partly be attributed to women representatives’ policy priorities, and in particular that women representatives are more strongly invested in the provision of low-corrupt and well-functioning public services compared with male representatives. It could also be attributed to women’s representation signaling a shift in the *modus operandi* of government towards a decreased tolerance towards corruption as well as endorsement of norms of impartiality and non-discrimination more broadly. Thus, women representatives are not only less likely to themselves be directly implicated in corruption scandals, but also reduce societal levels of corruption.

We rely on unique and newly collected data on the share of women in regional parliaments across Europe, along with four rounds of the European Quality of Government Index (EQI) survey (2010, 2013, 2017 and 2021, see Charron, Dijkstra, & Lapuente, 2014; Charron, et al., 2022). Our analysis shows a robust negative and significant association between the proportion of women in regional parliaments and citizens’ self-reported experiences of corruption. Our two-way fixed effects models show overall evidence of the expected relationship, averaged across countries and years. Substantively, we find that on average, a one standard deviation increase in

¹ While petty corruption may take several forms, bribery is perhaps the most common form of petty corruption and the empirical focus of this study. We subsequently use the terms petty corruption and bribery for public service delivery interchangeably.

female participation in regional parliaments is associated with citizens experiencing 1.5% lower bribe rates, all things being equal. If we take a region at the mean population in the sample, our results would imply that an increase in women representation by one standard deviation (12.7%) leads to around 34,800 fewer citizens paying bribes for public service delivery, which can be seen as a quite substantive change in the European context. In addition, we exploit temporal variation in the data to attempt to elucidate stronger causal evidence for our hypotheses and mitigate potential reverse causality endogeneity between our main variables via Difference in Difference (DD) design. In these analyses, we test differences in trends of bribe rates across three pairs of survey waves (2010–2013; 2013–2017 and 2017–2021), comparing citizens in regions that experienced an increase in women’s representation with citizens in regions that saw no such increase. In all cases, citizens experienced a steeper drop (or smaller increase) in reported experiences of corruption where women’s representation increased compared to regions where it did not. Furthermore, the DD effects are stronger in regions that have increased their level of women’s representation from relatively low initial levels, as well as when the absolute increase of women’s representation is larger. Notably, we find no changes in bribery rates due to a partisan shift in regional government.

We thereby seek to make several interrelated contributions. First, a closer attention to the role of women’s representation for citizens encounters with public service providers and street level bribery has implications not only for understanding the determinants of citizens’ effective access to services such as schools, health care and fair law enforcement (cf. Bauhr, Carlitz, & Kovacicova, 2023), but also to add to our understanding of how and why women’s representation reduces corruption levels. Studies to date suggest several reasons why women’s representation would reduce corruption levels, including that women are more honest (Dollar, Fisman, and Gatti, 2001), more risk averse (Esarey & Schwindt-Bayer, 2018) or less likely to have access to corrupt opportunity structures (Bjarnegård, 2013; Goetz, 2007). Most studies to date, however, pay surprisingly little attention to the theoretical issues raised by assuming away important differences between different forms of corruption, most notably between the corruption scandals that candidates are themselves directly involved in (or grand corruption), and bribery in public service delivery as experienced first-hand by citizens (petty corruption). Much in line with this, studies tend to use extant theoretical frameworks to explain why women candidates would themselves be less likely to be implicated in corruption scandals, rather than if, how and why these theoretical frameworks would help us better understand why women’s representation would reduce societal levels of corruption and street level bribery. This study proposes a theoretical framework that begins to bridge this gap. We propose that in order to understand how and why women’s representation have implications for the functioning of street level service provision, we need to place additional attention both to the priority that women place in well-functioning and low corrupt public service delivery as well as the signaling effect of including more women in office.

Second, to the best of our knowledge, this study is the first to seek to track sub-national corruption over time across European regions, making it the most comprehensive study on the link between women’s representation and corruption in Europe

to date. Investigating changes over time and sub-national variation allows us to gain a closer understanding of factors that may cause such changes. Our study thereby seeks to add to recent attempts to understand whether the link between women's representation and lower levels of corruption is indeed causal (Bauhr & Charron, 2021; Brollo & Troiano, 2016; Esarey & Schwindt-Bayer, 2018; Jha & Sarangi, 2018), and somewhat mitigate concerns that other factors may be driving both women's representation and lower bribery levels (Sung, 2003). As anti-corruption scholars increasingly point to the stickiness of perceptions-based corruption measures (Heywood & Rose, 2014) which makes any attempts to understand the effectiveness of anti-corruption reforms exceedingly difficult, our focus on first-hand reported experiences of corruption, as opposed to perceptions that tend to shift more slowly, also allows for a more reliable analysis of changes in corruption levels over time.²

Finally, our focus on corruption at the sub-national level reduces the role of country-specific factors such as slow-moving cultural values and norms. Moreover, it allows us to better isolate the effects of political gender equality on corruption experiences from larger anti-corruption/anti-bribery reforms in the civil service, which are most often applied at the national level (Maggio, 2020; Meyer-Sahling and Mikkelsen, 2022) Thus, we account for valuable within-country variation on the key variables of bribe experiences and women's representation, along with providing roughly six-fold more observations than country-level analyses. Restricting the sample to units that are politically relevant for the public services we investigate, this provides us with 206,236 respondents in 128 regions.

Women's Representation, Petty Corruption and Street Level Service Provision

Increasing citizen's effective access to public services that are less tainted by biases, discrimination or outright bribery, can improve social mobility and reduce poverty, but also serve to strengthen the social contract between citizens and the state and increase faith in democratic institutions. However, despite compelling evidence on the close association between women's representation and overall or aggregate perceived levels of corruption, (Dollar, Fisman, & Gatti, 2001; Swamy et al., 2001; Esarey & Schwindt-Bayer, 2018), fewer studies to date seek to investigate alternative measures of corruption, such as audit reports, corruption risks in public procurement or bribery (Bauhr & Charron, 2021; Brollo & Troiano, 2016; Jha & Sarangi, 2018). Aggregate indices to measure overall (perceptions of) corruption levels, such as the World Bank Control of Corruption index, Transparency International Corruption Perceptions Index or regional corruption indices are popular measures both among scholars focusing on corruption as an obstacle to the advancement of women (Stockemer, 2011; Sundström & Wängnerud, 2016) as well as studies focusing on women's role in reducing corruption levels (Dollar, Fisman, & Gatti, 2001; Esarey & Schwindt-Bayer, 2018; Stockemer, 2011; Swamy et al., 2001). To our knowledge, only two previous studies have found some evidence for a link between women's

² Studies that include separate measures of petty corruption tend to use only cross sectional data at one point in time (Bauhr, Charron, and Wängnerud, 2019; Jha and Sarangi, 2018) thereby raising issues of endogeneity.

representation and bribery using sub-national data in Europe (Bauhr, Charron, & Wängnerud, 2019; Jha & Sarangi, 2018), and most studies do not place particular attention to the theoretical issues raised by assuming away the differences between different forms of corruption.³ This risks limiting our understanding of if, how and when women's representation reduces corruption, not the least in light of evidence that all forms of corruption may not necessarily be equally responsive to institutional and accountability reforms (Bauhr, 2017).

A rich body of work seeks to explain the link between women's representation and lower levels of corruption. Some studies suggest that women are socialized into being more honest and trustworthy than men and are therefore more likely to reduce corruption levels (Dollar, Fisman, and Gatti, 2001). Building on studies suggesting that women tend to be more risk averse than men (Booth & Nolen, 2012; Bord & O'Connor, 1997; Croson & Gneezy, 2009; Watson & McNaughton, 2007), studies also suggest that risk aversion may prevent women from participating in corrupt transactions, especially in contexts where such actions risks being punished electorally (Esarey & Schwindt-Bayer, 2018). The risk of women candidates being punished for being implicated in corruption scandals may also de facto be increased if the electorate perceives that women should be more honest than men and therefore punishes them harder for norm transgressions (Barnes & Beaulieu, 2014; Eggers, Vivyan, and Wagner, 2018).

Alternatively, theoretical frameworks building on marginalization theories suggest that women are not only more risk averse, and therefore less likely to be implicated in corruption scandals, but also that they would be prevented from participating in corrupt transactions since they tend to be excluded from corrupt opportunity networks. Studies suggest that women are often more marginalized political outsiders (Barnes & Taylor-Robinson, 2018; Escobar-Lemmon & Taylor-Robinson, 2009; O'Brien, 2015; Schwindt-Bayer, 2010), and therefore excluded from the tightly knit, and oftentimes male dominated, networks where corrupt transactions are made (Bjarnegård, 2013; Goetz, 2007).

These theoretical frameworks have thus far primarily been used to explain why women politicians would themselves be less likely to be implicated in corruption scandals, rather than explaining why women candidates would have wider implications for societal levels of corruption, including i.e. reductions in bribery in street level service provision. However, it is less clear if candidate characteristics that prevents a candidate from him or herself participating in corrupt transactions are necessarily always an advantage when it comes to combating corruption more broadly. While women candidates may be less likely to themselves be implicated in corruption scandals because they are marginalized or risk-averse (at least in contexts where they are held accountable for such actions, see i.e. Esarey & Schwindt-Bayer, 2018), efforts to fight corruption are often freight with substantial personal and political

³ Furthermore, previous studies on bribery employ cross-sectional data and use a measure that aggregates the municipal-level rates of female political representation to the regional level. To advance beyond these studies, we propose a dynamic relationship whereby we focus on trends within those regions with elected regional parliaments, that have jurisdiction over the services in question. Furthermore, since these studies do not capture trends over time, it is difficult to know what types of changes in representation patters that lead to these proposed effects.

risks since it involves challenging influential elites (Okonjo-Iweala, 2018). Similarly, marginalized outsiders may oftentimes find it quite difficult to challenge influential elites while also remaining in office (Bauhr & Charron, 2021). Thus, to some extent, candidates that seek to implement comprehensive anticorruption reforms may sometimes benefit from being both willing to take risks and being reasonably well-connected to insider elites.

Thus, theoretical frameworks building on risk aversion and marginalization may not necessarily, or only partly, contribute towards explaining why women reduce bribery in public service delivery. We suggest that efforts to understand this link would also benefit from a closer attention to women's political agenda as well as the symbolic or signaling effect of including more women in elected office. Previous research suggest that women candidates may place particular policy priority on governments producing well-functioning public services and therefore seek to reduce bribery for public service delivery (Bauhr, Charron, & Wängnerud, 2019). Building on studies on the link between descriptive representation and substantive representation (Schwindt-Bayer & Mishler, 2005; Wängnerud, 2009), studies show that increases in women's representation oftentimes are accompanied with higher budget priority for spending in the welfare sector (Bolzendahl, 2009; Clayton & Zetterberg, 2018; Enns-Jedenastik, 2017; Svaleryd, 2009) and extensions of public services to areas such as child care provision (Bratton & Ray, 2002), and pre-natal care (Brollo & Troiano, 2016).

In other words, women's representation can extend access to services beyond previous "core" constituents and promote more inclusive and impartial public service delivery that is less tainted by corruption and bribery. This may partly be attributed to women candidates and/or their constituents being more dependent on a well-functioning public service delivery because of their traditionally greater care taking obligations, and in particular women constituents' greater vulnerability to bribery in public service delivery (Kubbe & Merkle, 2022). Women candidates may also be particularly affected by electoral pressure and face higher expectations among voters and constituents. Recent studies suggest that citizen's experiences of bribery have implications for demands for electoral accountability (Bauhr, 2017; Bourassa, Weitz-Shapiro, and Winters, 2022), and that women candidates are sometimes more harshly punished electorally for corruption (Barnes & Taylor-Robinson, 2018; Eggers, Vivyan, & Wagner, 2018).

Furthermore, descriptive representation may have an important signaling effect (Clayton, O'Brien, and Piscopo, 2019; Connelly et al., 2011; Reinwald, Zaia, & Kunze, 2023). Given that there is important evidence that voters (Barnes & Beaulieu, 2014; Eggers, Vivyan, & Wagner, 2018; Batista Pereira et al., 2020) and elites (Funk, Hinojosa, & Piscopo, 2021; Valdinì, 2019) alike share stereotypes or experiences about women politicians being more trustworthy and less corrupt, an increase in women's representation may signal policy priority on reducing corruption levels (Armstrong et al., 2022). Perceptions of women being more honest, cautious, or marginalized as discussed above, may aid a candidate in signaling a lower tolerance towards corruption. It is conceivable that such signals also influence norms of expected behavior in the civil service and trust in government (Rothstein & Stolle, 2003). Furthermore, more inclusive representation can send a broader signal of a

change in the modus operandi of government towards endorsement of norms of non-discrimination, impartiality, and meritocracy (Rothstein, 2018). Such “equal treatment” signal has less to do with women being seen as more honest and less corrupt, and more to do with the extent to which preferential treatment is seen as acceptable more broadly. If favoritism is fought and systems become more inclusive, tolerance towards asking for and paying bribes may also be reduced.

While citizens may not always notice changes in descriptive representation (Stauffer, 2021), civil servants both at the central and street level whose work are affected by new policies and priorities may be particularly attuned to such changes. Surveys among civil servant suggest that signals from political leaders are highly salient when civil servants make discretionary decisions, and that civil servants adjust their behavior based on how they perceive expectations of leaders (Aberbach, Putnam, & Rockman, 1981; Christensen, 1991; Olsen et al., 1983; Meyer-Sahling & Mikkelsen, 2022), whether this is attributed to self/career-interest, peer-pressure within the bureaucracy or alignment with the policy priorities of elected representatives (Egeberg et al., 2007). Politicians’ behaviors and considerations also influence those who operate at the street level (Davidovitz & Cohen, 2023; May & Winter, 2009). Thus, while street level bureaucrats operate in settings that allow for discretion, they are far from insulated from political pressure and considerations, nor clients’ expectations on the nature and quality of service delivery. In other words, elected politicians seek to monitor and influence the bureaucracy and hold bureaucracies accountable (e.g., Dahlström & Lapuente, 2017; Raffler, 2022). Moreover, studies show that the election of women in political positions may affect both the size of the bureaucracy and who is employed (Alberti, Diaz-Rioseco, & Visconti, 2022).

In sum, women representatives may be more invested than male representatives in seeking to reduce corruption levels as experienced first-hand by citizens both because of their greater policy priority on low corrupt public service provision and because citizens are more likely to hold women candidates accountable for failures to reduce corruption. There may also be a broader, and perhaps less tangible signal that inclusive representation sends: that of a system that promotes impartiality, non-discrimination and meritocracy, which should reduce preferential treatment based on gender, race or in the extreme, informal payments. This leads to our first hypothesis:

H1: The greater number of women in elected office, the lower the level of bribery in public service delivery

Our first hypothesis considers if women’s representation is associated with bribery in public service delivery, and if any shifts in women’s representation could mitigate overall increases in bribery levels, but also, reinforce reductions in bribery in times of general decreases in corruption levels. While it is important to note that such relationships are most likely part of a self-reinforcing dynamic, we seek to investigate some level of evidence for causality also running in the proposed direction.

Our second set of hypothesis considers what types of shifts in women’s representation that would matter the most. First, we expect these effects to be larger in

contexts where changes are substantial and represent a clear shift in the proportion of women elected. Secondly, we expect these effects to be larger in contexts where women's representation increases from initially very low levels.

In a study of changes in women's representation worldwide, Hughes & Paxton (2019) conclude that a "fast-track growth trajectory", where increases in the share of women representatives are comparatively large and sudden, has become more common in recent decades. These rapid changes are often accompanied by public discussions about gender quotas and related topics of gender equality (ibid.). A case in point is the 1994 election in Sweden when the proportion of women in the national parliament increased by seven percentage points, from 34 to 41 percent. Öhberg & Wängnerud (2014) show that MPs who entered the national parliament in that election constitute a distinguishable "class of 94" with a stronger representational focus on women as a group than other colleagues and groups of newcomers in previous elections. In other words, sudden and substantial changes in women's representation may explain particular dynamics that are associated with more pronounced changes. Potentially, such larger shifts may also be more likely to push legislative bodies across important thresholds, since evidence suggests that the influence of women's representation on sectors such as health and education is nonlinear (Funk, Paul, and Philips, 2022) Thus, we hypothesize that:

(H2a) In regions where women's representation increases more substantially, bribery levels will drop more sharply.

Although the effects of women's representation are most likely nonlinear, and more decisive changes can lead to more tangible effects, studies also suggest that comparatively few women entering a highly male dominated legislature may also be particularly impactful. Crowley (2004) analyzes the enforcement of child support programs at the state level in the United States, that allowed states to voluntarily pass laws representing varying levels of stringency regarding parents (mainly fathers) who fell behind in their child support payments. The analysis suggests that women representatives already as 'tokens' – below a proportion of 15 percent – were able to behave as "critical actors" (Childs and Krook, 2009) and make policy difference. This suggests that newness matters (cf. Beckwith, 2007) and that increases in the number of women representatives in contexts that have very few women elected can bring new ideas and perspectives to the decision-making process and also tend to attract more widespread societal attention. Thus, we hypothesize that:

(H2b) In regions where women's representation increases from initially lower levels, bribery levels will drop more sharply.

Thus, although investigating all potential observable implications of our proposed framework is clearly beyond the scope of this study, we investigate if women's representation changes levels of bribery to a greater extent when such changes could be expected to have both greater influence on policy trajectories and signal a more sudden or decisive shift in the status quo.

Sample, Data and Estimation

Our study employs observational data from four rounds of the European Quality of Government Index survey ('EQI', see Charron, Dijkstra, & Lapuente, 2014; Charron et al., 2015; Charron, Lapuente, & Bauhr, 2022). The survey inquires about citizens' perception and experiences of corruption with their local and regional public services. The emphasis of the EQI is to gauge the extent to which respondents believe their sub-national authorities administer services impartially and with a low degree of corruption. The advantage with this survey is the sub-national focus of the questions, the sample size per region,⁴ along with the same question on corruption experiences asked over four waves, which ensures valid over time comparability. More on the survey sampling and administration can be found in appendix Sect. 1.

While EQI survey data is available for all member states,⁵ we restrict our sample to those respondents residing in 'politically relevant' regions, e.g. where the NUTS region sampled in the EQI survey coincides with an elected regional parliament with administrative/fiscal responsibility over at least one of the services inquired about in the EQI (e.g. health care, education, law enforcement).⁶ We do this to avoid potentially misleading inferences from aggregation of data on political gender equality from lower level, and potentially heterogeneous, political units (e.g. municipalities, counties, etc.) than our NUTS 1 or 2 levels. Given this scope condition, the available sample becomes 206,236 respondents from 128 regions from 10 MS (see appendix 2 for more on the sample and administrative functions of the regions).

Our research question inquires about the effect of women's representation on actual corruption experienced by citizens (as opposed to perceptions). We thus rely on a survey question that asks about respondents' experiences with corruption in their public services. The question formulation is:

In the last 12 months, have you or anyone in your family given an informal gift or paid a bribe to: (a) Schools or other education services? (b). Health or medical services? (c). Police authorities? (d). Any other government-run agency?

The respondents answer 'yes' ('1') or 'no' ('0'), with the option of 'don't know/refuse'. Within our sample across all waves, 2.7%, 4.8% and 1.8% answered 'yes' to the question on education, health care and law enforcement respectively, while 2.2% did so for the 'other' category. As we are interested in overall corruption, for the main analyses, we elect to pool the question into a single variable that captures whether the respondent has any experience with bribery or not (e.g., '1' = answered yes on any of the four services above, '0' if otherwise). In total 13,113 (6.8%) of the respondents in our sub-sample expressed having experienced paying a bribe for a public service across the four years. The pooled (unweighted) regional variation across our sample ranges from 1.01% (Sjælland, Denmark) to 14.9% (Campania,

⁴ The EQI survey samples on the regional level used in this analysis. The average number of respondents across the four rounds is 1650.

⁵ The total sample available is 326,554 respondents across the four survey waves.

⁶ The EU's NUTS classification stands for 'Nomenclature of territorial units for statistics'. More on this can be found here: <https://ec.europa.eu/eurostat/web/nuts/background>

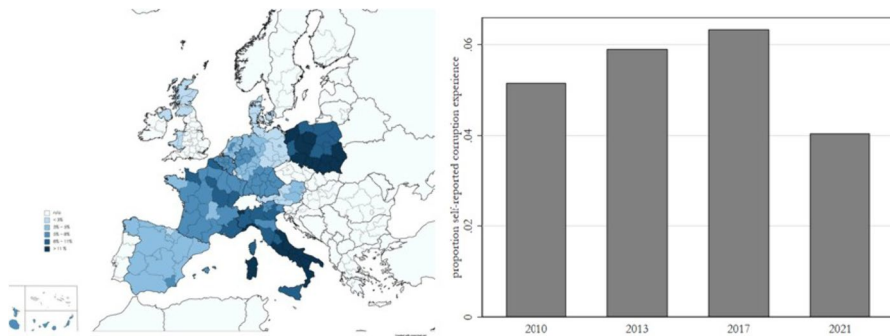


Fig. 1 Average Rates of Self-reported bribery in public services by sample region and year. Note: Left-side map reports unweighted regional means of self-reported corruption experience in any sector over the 2010–2021 EQI waves. Darker shades imply higher rates. White colored regions/countries are not included. Right side bar chart shows the population-weighted, aggregate proportion of the relevant sample by year (Color figure online)

Italy). Finally, as fewer than 1% of the respondents in all rounds elect the ‘don’t knows/refusal’ response, we remove them from the analysis. In addition to this question about having paid or not in general, the 2017 and 2021 EQI surveys also asks about the same services with the formulation “have you or anyone in your family *been asked by a public official* to give an informal gift or bribe”. While this does not indicate exactly if someone in fact paid, we include this question as a dependent variable in some main models and in supplementary analyses in appendix, as it indicates civil servant behavior. Figure 1 summarizes the regional averages over the 4 survey waves, with darker shades indicating higher rates, with the overall trends on the right side.

Indeed, our measure of self-reported corruption experiences presents some challenges. Among them social desirability bias which leads to under-reporting or other forms biases (for example, see Agerberg, 2020; Oliveros & Gingerich, 2020). Yet in our case, we are not primarily interested in the ‘true level’ of experienced corruption per se, but how gender equality explains patterns of observed variation. Thus, these issues would only bias the results if the tendency to under/over report were correlated with women’s representation at the regional level.⁷ However, despite the limitations, measures of self-reported experiences have been a valuable tool in better elucidating patterns of actual corruption the literature argues (for ex. Bauhr & Charon, 2018; Fan, Lin, & Treisman, 2009; Justesen & Bjørnskov, 2014; Razafindrakoto & Roubaud, 2010). Further, given the sample size and multiple time periods, this source provides us with the best and most comprehensive data to test our hypotheses in Europe. We thus view this as the best available measure.

We operationalize our main independent variable—women’s representation in politics—with a standard proxy: the proportion of women representatives in the

⁷ Using multi-level logistic analysis, we find that non-response to all bribe questions is unrelated with the proportion of female representatives, which suggest that there is little evidence that under-reporting is correlated with our main explanatory variable.

regional parliament at the time of the EQI wave. Accounting for regional level variation, rather than national, allows us to better isolate the focal relationship, as country-level comparisons of the gender-corruption nexus are likely plagued with omitted cultural and institutional factors that could be confounding along with overlooking salient within-country variation, and also provides a greater number of second-level observations. We collected data on the proportion of women MPs for all 128 regions over the 11-year span from primary sources. The variable has a mean of 0.34 and ranges from ‘0’ (Molise 2010; Calabria 2013; Basilicata 2013 and 2017) to 0.66 (Galicia 2017). Regarding over time variation, the average regional change between survey waves is 0.011 (standard deviation 0.055) with a max increase of 0.24 (Lodzkie, Poland, 2010–2013) and max decrease of -0.17 (Galicia, 2017–2021).

As our data is observational, we include several control variables to account for issues of possible endogeneity. At the individual level, we account for the respondent’s gender, age and level of education (three levels: <secondary, secondary and tertiary or higher). In addition, we control for whether the respondent claimed to have had first-hand contact with any of our three services in question during the past 12 months, which we expect will have a positive association with the dependent variable (Justesen & Bjørnskov, 2014), along with the type of survey administration – landline, mobile or online. At the regional level, we account for whether the government is run by a left/center left party or coalition to isolate the effect of women in parliament independent from partisan politics. We rely on Chapel Hill Expert Survey data (Jolly et al., 2022) for party coding, whereby we create a parsimonious binary variable if the party or lead-coalition party is less than ‘5’ on the expert left–right scale.⁸ Next, we account for whether the region has a female executive. As the election cycles of regions do not coincide exactly with the EQI survey waves in all cases, this variable is then the proportion of years between each survey wave that a region has a female executive.⁹ In addition, we control for the population and GDP per capita for each year of the survey wave as well as capital region status (0/1) as proxies for urbanization and overall development, which we expect are correlated with both corruption opportunities and gender equality (Charron, et al., 2017; Inglehart & Norris, 2003). All continuous regional level variables are standardized (z-score) for purposes of comparison. Summary statistics for all variables are provided in the appendix.

Our data has a hierarchical structure—individuals nested in regions, and regions nested in countries, nested in years. To account for the national level context, we elect to include country fixed effects, and for time effects, we include year dummies. To account for the spatial heterogeneity within countries, we cluster standard errors in our models at the regional level (128 regions from 10 EU countries with

⁸ Since regions have elections at different times that do not always line up with the survey ways, we code this the proportion of years with a left-leaning government (between 0-1) from one wave to the next.

⁹ The ‘executive’ is a regional governor, or if this position is not clearly stated, is considered as the party leader of the largest party of the governing coalition. In the case of the Netherlands, we take the proportion of females on provincial executive council (*Gedeputeerde Staten*).

Table 1 Test of H1 – Logistic models

	(1)	(2)	(3)	(4, alt.DV)
WP	-0.295*** (0.035)	-0.290*** (0.062)	-0.297*** (0.063)	-0.244*** (0.073)
Population		0.055* (0.031)	0.058 (0.033)	-0.048 (0.038)
Capital reg		0.149* (0.077)	0.150* (0.075)	0.239*** (0.079)
GDP p.c		0.092* (0.056)	0.067 (0.054)	0.020 (0.067)
Left gov		0.094 (0.059)	1.021 (0.059)	0.051 (0.057)
Year: 2013		0.093 (0.091)	0.010 (0.104)	
Year: 2017		0.355*** (0.107)	0.378*** (0.140)	
Year: 2021		0.464*** (0.083)	-0.127 (0.116)	-0.377*** (0.082)
Female			-0.282*** (0.025)	-0.393*** (0.027)
Age			-0.320*** (0.029)	-0.483*** (0.032)
Educ: secondary			-0.110*** (0.036)	-0.150*** (0.047)
Educ: tertiary			0.006 (0.035)	0.014 (0.040)
Service exp			0.555*** (0.052)	0.468*** (0.061)
Admin: mobile			0.047 (0.076)	0.016 (0.093)
Admin: online			1.174*** (0.083)	1.190*** (0.094)
Constant	-3.647*** (0.048)	-4.081*** (0.149)	-3.625*** (0.169)	-2.610*** (0.141)
Obs	206,236	206,236	206,236	133,209
Country FE's	No	✓	✓	✓

Logged odds coefficients reported from logit estimation. Standard errors clustered by region in parenthesis. Regional variables are standardized for purposes of comparison (z-score). Sample limited to respondents living in political relevant regions only. Reference group to education is 'less than secondary', and year is '2010' for models 1–3, and '2017' for model 4. Model 4 uses the alternative dependent variable ('been asked to pay'). Country fixed effects from models 2–4 not shown.

***p < 0.01, **p < 0.05, *p < 0.1

politically relevant NUTS regions). As our dependent variable is binary, we estimate all models with logistic regression.¹⁰

Empirical Results

Our first hypothesis implies that there is a consistent correlation between the level of women's representation and the level of corruption across regions in Europe. Table 1 provides a comprehensive look at the relationship.

Model 1 shows the focal bivariate relationship, and successively adds additional variables and interaction effects. Models 1–3 summarize the overall relationship between the proportion of women in regional parliament (WP) and experiences with bribery in public services. The variable shows an overall negative and significant association with self-reported bribery experiences. In models 2 and 3, two-way fixed effects and controls are added along with three regional level controls that could

¹⁰ Although our dependent variable is somewhat rare (6.8% overall), our sample size is sufficiently large to run standard logit (see for example: <https://statisticalhorizons.com/logistic-regression-for-rare-events/>).

potentially confound the relationship – capital region dummy variable, population and economic development proxied by Euros per inhabitant (logged). Model 3 adds our individual level controls. We find that the effects of WP hold across all countries and years, and accounting for regional and individual controls. The coefficient in model 3 for example shows that a one standard deviation increase in women’s representation in regional parliaments (12.7%) is associated with a lower rate of corruption experience by just over 1.5%, all things being equal.¹¹

Testing the Dynamic Effects—H2

While Table 1 provides strong associational evidence, some argue that corrupt environments tend to serve as a barrier to women’s representation, and there are obvious concerns about reverse causality (Bjarnegård, 2013; Jha & Sarangi, 2018). We now move to an analysis with a greater emphasis on causal effects that also better captures the proposed mechanisms. Given the multiple survey waves, we exploit the temporal variation in the data and estimate the dynamic effect of an increase in women’s representation from one wave to the next via a quasi-experimental difference in difference (DD) design.¹² Using a parsimonious 2×2 strategy (two time periods, two groups), we identify regions that experienced any increase in women’s representation from one survey wave ‘t-1’ to survey wave ‘t’ and code such respondents as ‘treated’ cases ($W = 1$). The rates in the dependent variable from one round to the next are then compared with the ‘control’ cases ($P = 0$); e.g. the petty corruption experiences from one wave to the next among respondents who live in a region where women’s representation either remained the same or decreased.¹³ Formally, we estimate the following:

$$Y_{ci} = \alpha + \beta(W_c) + \delta(T_{ci}) + \theta(W_c * T_{ci}) + \lambda_{ci} + \gamma_c + C_i + \mu_i$$

Where a respondent’s corruption experiences in a given region (Y_{ci}) are explained as a function of the ‘treated’ cases who experience an increase in women’s representation (β) between two consecutive waves in a given region, a time-count (δ) and the interaction term (θ), which serves as a difference-in-difference (DD) estimator. We include individual level controls (λ), regional controls (γ) and country-level fixed effects (C), which account for the broader, unobserved contextual level of corruption experiences and gender equality. Any significant interaction effect for θ implies that trends in corruption experiences have changed systematically within the ‘treated’ group compared with the counterfactual ‘control’ group of respondents whose

¹¹ According to Eurostat, the average population (15 or older) of the 128 regions in our sample is roughly 2,32 m. 1.5% corresponds roughly to 34,800 people.

¹² Admittedly, we lose some of our temporal variation with this approach compared with a standard fixed effects estimation but do so purposely for precision: to isolate within-region, positive increases compared with no increase/decline in women’s representation specified in our hypotheses rather than conflating positive and negative changes over time.

¹³ In addition, we separate these two groups in the control cases – those that remained the same, and those regions where a decrease was observed (see Table A5).

regional parliament did not experience an increase in women's representation. If our hypothesis is correct, θ should be negative and significant.

The causal identification of our design includes the assumptions of parallel trends of 'treatment' and 'control' groups across waves and no spillover or other confounding effects. We assess this assumption in the penultimate section of this article. Moreover, as the EQI contains independent samples for all years (e.g. no panel waves) our design also assumes that the regional groups of respondents from one survey wave to the next are representative of the population and thus comparable. While the EQI samples are intended to be representative at the regional level (via random selection with CATI and demographic quotas self-administered via online), we also use post-stratification weights on gender, age and education levels (compared with Eurostat population figures) to better ensure representativeness.

As increases in women's representation across the sample are observed for different regions in different waves, we isolate these DD effects for each wave change via three separate models – (a) 2010 to 2013, (b) 2013 to 2017 and (c) 2017 to 2021 (see appendix 3 for proportions of treated cases by wave). We believe this approach is more transparent and elucidates clearer the dynamic effect patterns than a multiple-wave estimator, which could be driven by strong DD effects from a single set of surveys waves. For the estimation of 'b' and 'c', we also rely on a sub-set of regions based on simple exact matching, whereby only cases that are untreated in previous time periods are considered.¹⁴ In addition, we include the final two models where the dependent variable is a respondent 'being asked' to pay a bribe or informal payment for one of the services in question. As this question formulation is only included from 2017 onward, only one pair of survey waves is analyzed (2017–2021). Finally, we control for whether a regional election was held between the two survey waves.¹⁵

The results from Table 2 show that in all cases, we observe the expected effect; the DD estimate is negative and significant at the 95% level of confidence in all models, and at the 99% threshold in all save models 2 and 6, with the greatest effect being from 2017 to 2021. Moreover, we see that civil servants ask citizens with lower frequency as the proportion of women in regional parliaments increase (model 6), which suggests additional evidence for the mechanism of signaling. In the cases where we can employ a matched set of regions, the DD estimate is 2–4 times greater than in the full sample, which includes some control cases that had observed increases in women's representation in previous waves. Given that the design assumptions hold, we interpret this as increases in women's representation within regions from one year-wave to the next leads to less corruption experience compared with cases that saw no such increase in women's representation.

Figure 2 summarizes the findings, whereby we highlight the full sample for each wave analysis for the sake of comparison. In the case of 2010–2013 (model 1), we observe that there was, on average a decrease in bribe rates among all respondents that lived in regions where WP increased between 2010 and 2013,

¹⁴ Formally, the observations that belong to the matched group (M) for the analysis of time period 't' to 't+1' are defined as $M_{it} = 1$ if $W_{it-1} \dots W_{it-n} = 0$, where W_{it-1} represents any past treated observations.

¹⁵ We thank an anonymous reviewer at Political Behavior for this suggestion.

Table 2 Difference in Difference (DD) Estimates by Paired Survey Waves

Variable	2010–13	2013–17	2013–17	2017–21	2017–21	2017–21(a)	2017–21(a)
WP increase	0.209** (0.079)	– 0.022 (0.046)	– 0.056 (0.063)	0.193*** (0.053)	0.538* (0.299)	0.241*** (0.054)	0.071 (0.337)
Year	0.132** (0.072)	0.275*** (0.045)	0.359*** (0.066)	– 0.354** (0.041)	0.195 (0.088)	– 0.246*** (0.043)	0.004 (0.100)
Diff-in-Diff (DD)	– 0.278*** (0.092)	– 0.233** (0.058)	– 0.404*** (0.081)	– 0.510*** (0.071)	– 1.799*** (0.160)	0.378** (0.071)	– 1.250*** (0.148)
Constant	– 3.32*** (0.137)	– 3.74*** (0.16)	– 3.95*** (0.14)	– 4.25*** (0.14)	– 5.27*** (0.239)	– 3.46*** (0.12)	– 4.09*** (0.30)
Obs	72,877	100,513	50,96	92,303	20,791	92,333	21,246
regions	127	127	62	128	27	128	27
Sample	All	All	Matched	All	Matched	All	Matched
Pseudo R ²	0.089	0.115	0.123	0.081	0.135	0.069	0.126

Logged odds from logistic shown. Robust standard errors are in parenthesis. Models 1–5 employ the binary dependent variable whether the respondent paid a bribe for any service in question, while models 6 and 7 estimates whether the respondent was asked. All models include controls for respondent gender, age, education, public service experience, along with country fixed effects and regional population, GDP per capita, proportion-years of left government, proportion-years of with female executive, capital region and whether a regional election was held between the paired survey waves. Sample limited to respondents living in political relevant regions only, while the matched samples are an exact matched set based on only those regions where no observed increase in women's representation happened in any of the previous waves. For more direct comparability over time, only CATI respondents are used. Post-stratification weights used in all models.

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

whereas the 'control' cases actually increase, on average. Models 2 and 3 show different, yet significant DD effects, whereby we observe an overall increase in bribe experiences from 2013 to 2017, yet the corruption experience trend was considerably lower in areas that had an increase in WP. Conversely, we see an overall decrease in bribes from 2017 to 2021, with respondents in those regions with an increase in WP showing the steepest decline.

In addition to showing overall dynamic effects of the focal relationship, H2 posits that the signaling effects of an increase in women's representation will be greater with greater absolute increases, and more noticeable in regions where the level of women's representation was relatively low to begin with (e.g. a larger marginal increase). To test these, we re-run the DiD with two adjustments. First, we create a dummy variable for 'larger increase', whereby a region is coded as '1' if we observed an increase by 5% or greater in women's representation from one wave to the next.¹⁶

Figure 3 summarizes the DD effects of five separate model specifications for each pairwise wave comparison (see Appendix Table A4 for full results). Specification

¹⁶ We chose 5% as a threshold as it is sizeable enough to notice, while still providing us with enough treatment observations (see Table A3 for summary statistics).

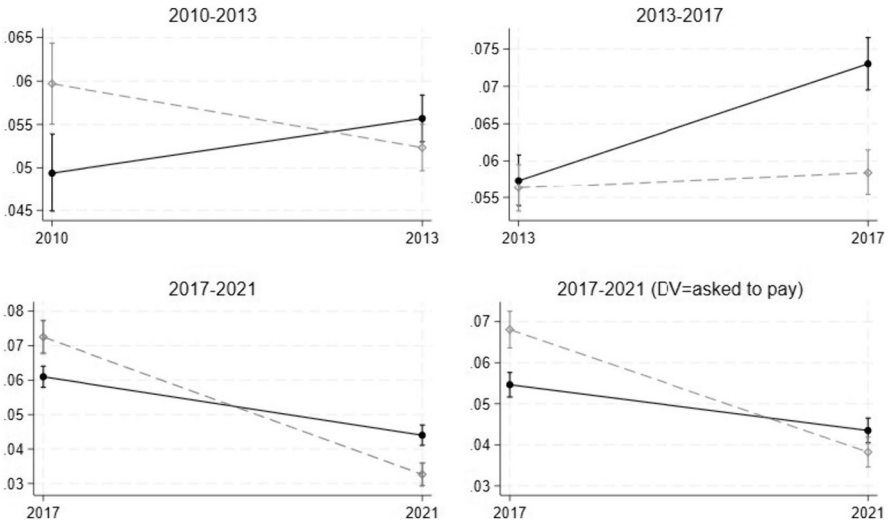


Fig. 2 Summary of Difference in Difference Effects. Note: figure summarizes findings from Table 2 from models 1, 2, 4 and 6. Y-axis is the predicted probability of corruption experiences, and the x-axes are the years in each model. Black dots and hollow diamonds represent 'control' and 'treatment' cases respectively. 95% confidence intervals from regional clustered standard errors in parentheses (Color figure online)

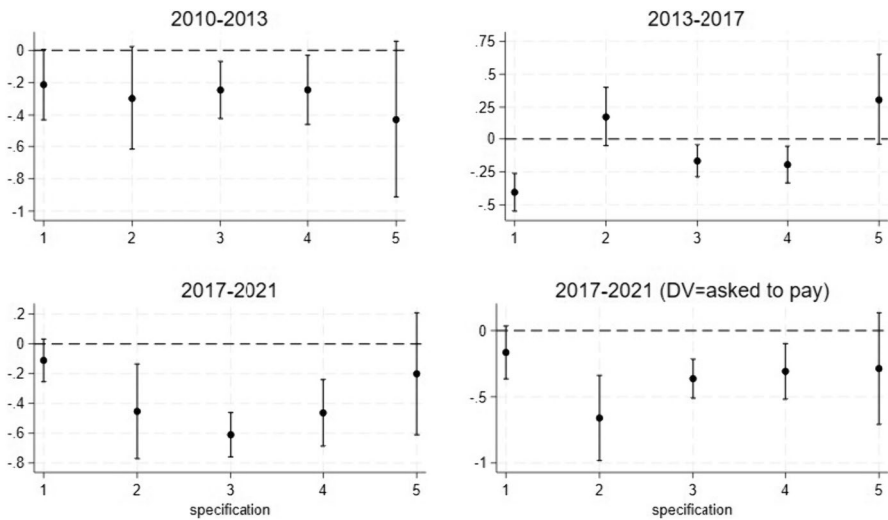


Fig. 3 Summary of DD Estimates for H2. Note: Figure summarizes the DD estimates from 20 separate models. Y-axis is the DD on corruption experiences, and the x-axes denote the five model specifications, from left to right—(1 and 2) regions with initially lower (2) higher than mean levels of women in parliament (WP). (3) Regions with an increase in WP by 5% or greater. (4 and 5) 5% greater increase in WP and initially (1) lower (2) higher than mean levels of women in parliament (WP). 95% confidence intervals shown from robust standard errors

1 and 2 isolate the DD effects in regions with initially lower and higher than mean levels of women in parliament, respectively. Specification 3 codes only regions as ‘treated’ with an increase in WP by 5% or greater, while specifications 4 and 5 combine a 5+ % increase with initially lower (4) and higher (5) than mean levels of WP. On whole, we find robust evidence for the ‘strong’ signal effect; when increases are larger, citizens’ experiences with corruption drops significantly (specification 3). We also see that the effects of any increase are generally stronger in regions with initially low levels of women’s representation compared with those with relatively higher starting levels (e.g., specifications 1 and 2), save for the 2017–2021 analysis. Specification 4 tests the combined effect of a 5% or greater increase among only regions with lower levels of women’s representation, and we find robust, negative DD effects in all three wave comparisons. However, larger increases in women’s representation do not yield significantly lower rates of bribe experiences among regions with relatively higher starting levels of gender equality. Overall, we interpret this finding as showing support for H2a and H2b; the effects of an increase in women’s representation over time within regions on average leads to less experienced corruption among citizens living in areas where gender equality was lower to begin with.

Finally, we also check for indirect support for our proposed mechanisms via additional analyses. One, regarding the welfare-priority mechanism from the literature, we test if women in particular are less likely to experience corruption in places with higher women’s representation on average (see Bauhr, Charron, & Wängnerud, 2019). In this case, we run a random-effects, hierarchical model with a cross-level interaction between respondent gender and proportion of females in regional parliament. We do in fact see that, on average, when women’s representation is higher, women respondents’ experiences significantly less corruption in public services than do male respondents which is consistent with the mechanism, albeit the differences in slopes are relatively modest (see Table A8 in the Appendix). In addition, we test the dynamic effects via DiD for split-samples of male and women respondents. Although we find the DD estimates larger among women in all three wave comparisons, which is consistent with our expectations, the differences in the DD effects are not significantly different between male and female respondents (see appendix, Table A9 for results).

Checks of Robustness and Validity of Design Assumptions

We begin by testing the sensitivity of the findings. First, as the ‘control’ cases in the DD analyses include both regions that declined in their proportion of women in parliament and those that remained constant, we run several additional tests where we separate these two groups. Table A5 reports the results of split sample models where ‘treated’ cases are compared against both types of control cases separately.¹⁷ We find that the DD is mainly robust, yet the estimate is most consistent when regional increases are compared exclusively against regional decreases.

¹⁷ As the number of cases that declined in women in parliament in 2010–2013 survey waves was just 2.2%, we do not perform this test for this particular wave comparison.

Second, we perform several tests to check the validity of the design assumptions. One, the DD estimator relies on the assumptions of parallel trends between control and treated cases for past years prior to the intervention. For the 2010–2013, we cannot test this assumption unfortunately due to lack of data. Yet for the 2013–2017 and 2017–2021 wave estimates, we assess the parallel trend assumption comparing the rates of corruption experience in control and treated cases for previous waves with a visual as well as a joint F-test of trends in previous years (see Wing, Simon, and Bello-Gomez, 2018). Figures A1 and A2 (see appendix 4) plot the levels of the dependent variable across the treated and control cases and show rather clearly that the difference over time between these two groups occurs in the time period expected, while prior years mainly follow parallel trends. Moreover, the joint F-tests in trends across years prior to the treatment period in both cases yield insignificant results ($p=0.20$ for the years prior to the 2017–2021 treatment, and $p=0.68$ for the 2013–2017 treatment).

Third, we check whether changes over time observed in our dependent variable are the results of changes in alternative factors. We test whether a change in regional government partisanship between survey waves also led to similar declines in rates of corruption experiences via DiD. We find that changes in regional government do not discernibly explain changes in rates of bribery experience (Table A6).

Fourth, we perform a set of tests to assess the degree to which the treatments vary over time. In this case, we use such test to both check for possible lagged effects of past increases in women's representation and as a placebo test (Table A7), where we test whether the treatment in one set of years has any effect on another set of survey years. For example, we test whether the set of treated and control cases from 2017 to 2021 has any effect on the 2010–2013 analysis. Of course, we do not expect any effects of the treatment for years temporally prior to the effects (or possibly even following the treatment effects in subsequent waves). We find that DD is insignificant in all cases where the treatment temporally follows the survey waves used in the analysis (e.g., 'treated' cases for 2017–2021 and 2013–2017 are insignificant for the 2010–2013 sample and 2017–2021 treated cases are insignificant for the 2013–2017 sample). We also find that treatment effects that occur in prior years do not explain changes in the dependent variable with regions over time, with the exception of the 2013–2017 treatment effects on the 2017–2021 changes in petty corruption, implying there could be beneficial lagged effects of women's representation on lower corruption experiences.

Next, we check to see if certain sectors are driving the results (Table A8). We find that the welfare sector services (education or health care) yield a negative DD estimate in all cases, and one or both of them are statistically significant across all waves. While we find that the DD effect for law enforcement is significant for 2017–2021, it is not so in the other two analyses, thus our findings are driven mostly by the welfare service sectors, which could also reflect that these services are most often administered at the regional level by the cases in our sample.

Furthermore, we re-ran all analyses using alternative ways to account for the hierarchical structure of the data. Namely, we employed multi-level logistic regression with random regional intercepts and found substantially similar results. Moreover,

we re-ran the results using regional-level fixed effects in lieu of the country-level and found the results to be even more pronounced (Table A9).

Finally, we control for the % of years in which a female was seated as an executive for each region-survey wave. Although this measure is as close as we can get in our sample to proxy for women executives, it is far from ideal for purposes due to heterogeneity between our contexts. Adding this variable does confound the effect of some variables that we previously reported as significant (left government, population), but it does not affect our main results on the effects of the proportion of females in the regional parliament (see table A10).

Conclusion and Discussion

This study investigates if women's representation has implications for the level of bribery in public service provision. In doing so, it provides one of the most comprehensive tests of the association between women's representation and petty corruption experienced by citizens in Europe to date. Using unique data over time, including four waves of the European Quality of Government Index (EQI) survey from 2010, 2013, 2017 and 2021 and newly collected data on women's representation in European regions, we are able to track developments in corruption across both time and space. First, we find that there is a strong and consistent association between higher rates of women in regional parliaments and rates of bribery across European regions in 10 countries, demonstrating support for H1. Second, we seek to address issues of potential reversed causality by exploiting that our multi-wave EQI data allows for a quasi-experimental difference in difference (DD) design. We find that an overall increase in women's representation reduces bribery-rates relative to where we do not observe such an increase. Moreover, we find that both greater absolute increases in the share of women in regional parliament and greater marginal increases (i.e., from initially lower levels of women's representation) depresses bribery levels more decisively (H2a and b).

Thus, despite the 'stickiness' of corruption, our approach allows us to track changes in corruption levels across time and across regions in Europe that are highly diverse in terms of GDP/capita, levels of gender equality as well as corruption levels. Notwithstanding these differences, we find strong support for the effects of women's representation on corruption. Our study thereby expands our current understanding of the gender and corruption link and allows us to investigate not only the reach (i.e. across time and diverse regions) but also the 'depth' of the effects of women's representation, by showing how such changes in representation patterns are related to bribery in public service provision as encountered by citizens in their interaction with street level service providers.

Our results could be understood in light of at least two important insights in the broader literature on political representation: One, that women politicians, on average, have a different policy agenda (see e.g. Bolzendahl, 2009; Bratton & Ray, 2002; Ennsler-Jedenastik, 2017; Schwindt-Bayer, 2006; Mechkova & Edgell, 2023). Namely, that they are more inclined toward prioritizing improvements in social welfare services for a wider scope of constituents, possibly due to women traditionally

assuming more care taking responsibilities (Bauhr, Charron, & Wängnerud, 2019). Since women constituents are disproportionately negatively affected by bribery in public service delivery (Kubbe & Merkle, 2022) and experiences of street level corruption has electoral consequences that may disproportionately punish women candidates, women candidates may place particular priority on reducing corruption in public service delivery. That our findings indicate that women's representation lowers bribery in welfare services under control for left-government partisanship further corroborates this mechanism. Two, whether objectively accurate or not, women representatives are sometimes expected to have higher integrity than their male counterparts (see e.g. Valdini, 2019; Armstrong et al., 2022; Eggers, Vivyan, & Wagner, 2018; Barnes & Beaulieu, 2014), and gender balance also signals that government institutions prioritize inclusiveness and nondiscrimination. Short-term increases in the proportion of women representatives may therefore send a strong signal of new standard operating procedures of impartiality and equality throughout the polity, and reduced opportunities for informal payments and bribery.

Our findings sound a call for continued exploration into why women fight corruption more broadly, as a complement to the larger field that places particular theoretical attention to explaining why women candidates refrain from (Dollar, Fisman, & Gatti, 2001; Esarey & Schwindt-Bayer, 2018) or are excluded from opportunities to (Bjarnegård, 2013; Goetz, 2007) being implicated in corruption scandals. Placing additional attention to the theoretical and empirical issues raised by investigating bribery in citizen's encounters with public service providers, will allow us to gain a better understanding of the far-reaching implications of women's representation. Our study provides evidence for what kinds of changes in women's representation that can be expected to have a more decisive impact on street level bribery. It is important to note, however, that it is beyond the scope of this study to investigate the proposed mechanisms in full. This could be done, for instance through follow-up surveys, conjoint experiments or in-depth interviews with civil servants at both managerial and street level, as well as more direct measures of these mechanism at citizen level. Furthermore, future research may want to pay additional attention to the extent to which our findings travel across contexts, as well as the implications of reducing the share of male representatives.¹⁸

Our study provides an explanation for important shifts in regional levels of corruption in Europe over time and substantiate the importance of sub-national political representation for public service provision and the functioning of the public sector. It also suggests that a closer attention to the type of corruption that women's representation reduces can help us better understand both how and why women's representation matters.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11109-024-09925-x>.

Funding Open access funding provided by University of Gothenburg.

Data availability Data and replication do-files are available here: <https://zenodo.org/records/10518708>.

¹⁸ We thank an anonymous reviewer for pointing this out to us.

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