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Abstract

Arguably, the single person with the most influence over any country's policies is the chief executive, head of state, or head of government. Research has also consistently shown systematic gender differences in politicians' priorities and behavior. Yet, few academic manuscripts connect these two lines of research; we have not understood to a sufficient extent the effects of having a woman chief executive. To fill this gap, this paper studies the imprint of gender leadership patterns on budget composition across 155 countries between 2000 and 2016. Matching methods help overcome the low number of women chief executives (36 countries) and improve the validity of causal inference. This paper shows that having a woman chief executive is associated with a subsequent increase in government spending for healthcare – a policy consistently found to be higher on women's priority lists than men's. This positive effect is present only when women hold de-facto power – i.e., not when women hold ceremonial positions – and is not present when considering education or military resources expenditure. Thus, the findings from this paper add to the evidence that identity politics matter, as women national leaders can have transformative effects on policy outputs, particularly in areas prioritized by women.

Keywords: women leaders, healthcare, descriptive representation

1. Introduction

The issue of representation in politics has become increasingly salient in recent years, grabbing the attention of researchers, journalists, and the wider public. The literature on representation has shown that the presence of previously excluded groups has symbolic importance as a sign of who is legitimately able to make the country's most important political decisions while encouraging a sense of trust in national institutions (Alexander and Jalalzai, 2020; Mansbridge, 1999; Paxton and Hughes, 2007). But what does the entrance of previously marginalized groups into the highest levels of governance mean for policy outputs, particularly in terms of policy prioritization?

There is extensive research on the consequences of gendered representation. The expectation of the effect of more women attaining positions of power, termed 'descriptive representation,' is that 'substantive representation' should be a natural byproduct – implying women will use their positions to advocate for women's interests (Mansbridge, 2005; Sapiro, 1981). However, research shows that there is no guarantee that this will happen in practice; women are simply more likely than men to work for other women's interests as they become more present in politics (Phillips, 1995). What constitutes women's interests is up for debate given that women are also present among every other social category – for example, ethnicity, rural/urban divide, ideology, among others. Yet, because of their gender,[1] women share a set of common preferences and social experiences, which then have political implications (Celis and Childs, 2008).

The empirical evidence for the descriptive-substantive representation link is not straightforward and largely depends on the researchers' institutional focus, as well as how they define substantive representation (Franceschet and Piscopo, 2008). Furthermore, the studies tracing the concrete policy outputs of women in political power are fewer than those focusing on their behavior as individuals, producing mixed results (Smith, 2014). Importantly, a large share of the research has focused on studying legislatures (Bhalotra and Clots-Figueras, 2014; Clayton and Zetterberg, 2018; Swiss, Fallon and Burgos, 2012), while there have been far fewer studies focusing on the effects of having a woman national leader (Jalalzai, 2004). This is a major research gap as the executive has by far the greatest influence over a country's main policies. The low number of women leaders is perhaps the leading reason for the general lack of comparative studies in this field.

[1] This paper is addressing gender differences. This is separate to differences in sex, which are purely biological in nature.

Here is where this paper makes its contribution. Capitalizing on the recent strides made by women in politics, this paper considers the independent effect of having a woman chief executive on the implementation of women's policy priorities through a comparative perspective. Similar to previous research in the field of politics and gender (Clayton and Zetterberg, 2018; Mechkova and Carlitz, 2020; Smith, 2014), shifting government resources towards healthcare is used as a proxy for women's policy priorities (Clayton et al., 2019). The adoption of the budget is a result of legislative-executive collaboration. While previous research has found that the gender composition of both the cabinet and parliament affect government spending priorities (Clayton and Zetterberg, 2018; Mechkova and Carlitz, 2020; Mavisakalyan, 2014), we have not understood to a sufficient extent the effects of having a woman as a national leader. Several lines of argument suggest that we should pay more scholarly attention to the gender of those occupying the highest office, with the expectation that women in the executive will alter public policy to benefit women in general.

Chief executives are in a unique position to shape policy outputs as they are the ones to set the government's policy priorities. When it comes to adopting national budgets, the practice across countries varies in the extent to which legislatures can amend the size and scope of the budget. However, across different government systems, the budget proposal comes from the government, providing, at a minimum, the opportunity to finance the policies they prioritize. Importantly, the chief executive usually has considerable influence over the two institutions involved in the budget, as they select the members of the cabinet and are *typically* the leader of the parliamentary majority party. This big influence on the institutions of the highest officeholder motivates the need to put greater emphasis on what explains their behavior.

To determine whether women national leaders stand for issues particularly relevant for other women, this paper discusses two main sets of issues: First, would women from the elite represent non-elite women? And second, as women politicians are typically seen as newcomers, would they have the resources to realize their priorities? To answer these questions, I first rely on theories of descriptive representation (Phillips, 1995), which stipulate that, either due to their own preferences or a conscious decision to stand for other women, female leaders should be more likely to represent women's interests than their male counterparts. Secondly, the theory of political incorporation suggests that numerical representation in the highest positions of power should, to the greatest extent, enable the

realization of the represented group's interests (Browning, Marshall, and David, 1984; Smith, 2014). Previous research has found that women in the executive have the capacity and resources to successfully implement their goals at the same rate as their male counterparts (Escobar-Lemmon and Taylor-Robinson, 2016). Therefore, I expect that when women assume the highest office, we should see visible changes in government spending priorities.

To empirically test these implications, I conduct an analysis on time-series cross-sectional data of 155 countries from 2000 to 2016.[2] The main methodological challenges to this study stem from the low number of women national leaders (36 countries) and selection effects. That is – countries that elect women leaders may also happen to invest more in healthcare. To address these concerns, I use different methodological strategies: matching methods, OLS regressions with year-fixed effects, and country and region-fixed effects.

The results suggest that having a woman chief executive is associated with higher government expenditure for healthcare. This finding is robust to different model specifications, including various confounding factors such as political ideology, democracy, corruption, and gender equality. There is a sizable effect on policies only when women hold the de-facto power; that is, women in largely ceremonial positions such as vice-presidents, or presidents under a parliamentary system, have no impact on the policy output examined here. There is also no statistically significant association between the gender of the leader and three placebo outcomes: healthcare expenditure from external non-governmental sources, education (policy priority shared by both genders), and military expenditure (largely a male priority). These null results strengthen the confidence that there is a meaningful relationship between a woman chief executive and domestic healthcare expenditure.

This paper extends a growing body of literature on the substantive effects of electing women to positions of power by focusing on a less studied, but very powerful, institution – the executive. This paper contributes to the expanding field of comparative gender politics (Htun and Weldon, 2010) by bringing in evidence from different contexts. At the same time, studies on concrete policy outputs are also less prominent. Thus, the study offers an insight into the effects of representation on a concrete, measurable action, giving evidence about the transformative effects of including women in national leadership positions.

[2] The list of countries included in the analysis is available in Table 4.

2. Theory

2.1 Why does representation matter?

By increasing the number of women in power, there is an expectation that there will be a subsequent improvement in the representation of their interests (Mansbridge, 2005; Sapiro, 1981). While what constitutes women's interests is not settled, Sapiro (1981) famously argued that political representation is justified as long as women share particular social, economic, and political problems, or understand how to solve those problems.

There is rich empirical evidence that such differences exist between men and women across various contexts, as women share specific political, economic, and social experiences that differ from men's (Celis and Childs, 2008). These experiences are "constructed by human agency" rather than biology (Beckwith, 2014). For example, Beckwith (2014) describes that a woman's experience as a mother, a large portion of an average woman's life, is shaped by the availability of prenatal and postnatal care, maternity leave, and childcare, as well as by socio-cultural practices – i.e., who is expected to assume responsibility for childrearing. Women, more than men, are socialized to take care of others (Hutchings et al., 2004) and, historically, have been disproportionately tasked with general household chores and raising children (Box-Steffensmeier, De Boef and Lin, 2004). Thus, issues relating to childcare, family, and healthcare have commonly been defined as core areas affecting women more than men. As a result, this division of labor also has political implications for women's public policy prioritizations. Not surprisingly, women support policies that would cover their obligations at home; this extends to both women as citizens and women as politicians (Griffin, Newman and Wolbrecht, 2012; Schwindt-Bayer, 2006; Clayton et al., 2019; Wängnerud, 2000).

Extending the findings about difference in preferences, the expectation is that women politicians will also act differently than their male counterparts. An important caveat is that, in general, the goal of a politician is to serve the community or nation rather than a specific interest group (Lovenduski, 2005). Furthermore, women and men can be equally constrained in the extent to which they can act by ideology (Reingold, 2008) or simply because they are in opposition (O'Brien, 2015). Finally, both men and women can be feminists, with strong links to civil society organizations, and thus, can support women's interests (Reingold, 2008; Wängnerud, 2015).

However, even if the descriptive-substantive link is not guaranteed, women should be simply more likely than men to stand for women's interests due to their specific experience as a group (Phillips, 1995). As Phillips (1995) famously put it, the "politics of presence" is important to ensure fair representation of previously marginalized social groups. Prior research has found that women politicians view women as a special constituent group (Wängnerud, 2000; Thomas, 1994). At the same time, politicians' personal preferences matter, given the significant autonomy politicians have in their everyday work (Phillips, 1995; Chattopadhyay and Duflo, 2004). Thus, either due to a conscious decision to stand for women or personal preference, women politicians can be expected to make decisions that align more closely with the preferences of other women. The act of representation can take on many forms. For example, it can look like putting women's issues on the political agenda (Devlin and Elgie, 2008), bringing them up during parliamentary debates (Yoon, 2011), adopting specific legislation (Wang, 2013), or allocating more money for specific programs to benefit women (Clayton and Zetterberg, 2018).

2.2 Existing research on budget composition and women's representation

In this paper, I choose to focus on expenditures as a measure of substantive representation. The amount of money earmarked for a particular policy is an ideal case study as it represents a concrete, measurable action that demonstrates a government's priorities. Moreover, unlike policy outcomes, such as maternal or child mortality, success does not depend on other actors down the implementation chain and is not controversial enough to be out of reach of women national leaders.

Budgets represent the "...collective political decisions made in response to incoming information, the preference of decision-makers, and the institutions that structure how decisions are made" (Jones et al., 2009). As Clayton and Zetterberg (2018) explain, studying changes in spending priorities within countries allows the institutional component to remain relatively constant, thus isolating policymaker priorities. Specifically, budgets are borne out of the interaction between the legislative and executive branches; while previous research has extensively examined how the gender composition of the legislature and the cabinet affects healthcare expenditure, the role of the chief executive is not well understood. I argue that this is an important research gap as the chief executive is the individual with the most influence over policies. First, we will examine the existing evidence pertaining to budget and representation from the gender and politics literature before addressing the specific role of the chief executive in this process.

By and large, previous representation research agrees that women parliamentarians are efficient in advancing women's priorities (Reingold, 2008; Wängnerud, 2009), particularly when considering healthcare expenditure. This finding is supported across different samples and research designs. Clayton and Zetterberg (2018) study the effects of introducing parliamentary gender quotas on the shares of the budget for healthcare, education, and the military. By leveraging data from 139 states between 1995 and 2012, the authors show that when the introduction of quotas leads to a substantive increase in the number of women in parliament, subsequent spending for healthcare also increases. This change is offset by relative decreases in military expenditure, while changes in spending for education – a policy priority shared across genders – are not associated with the gender of the leader. In a study focusing on sub-Saharan Africa from 1958 to 2015, Mechkova and Carlitz (2020) also find that higher numbers of female legislators are associated with higher budgets for healthcare, helping to address issues such as infant and child mortality. Rehavi's (2007) regression discontinuity design of close elections in the US also concludes that the number of female legislators is associated with greater healthcare expenditure at the state level. Between 1970 and 2000, the 15 per cent increase in healthcare spending is considered an effect of women's entry into politics in the US . Finally, Chen (2010) uses an instrumental variable approach[3] to show a similar finding. The analysis of 103 countries between 1970 and 2006 suggests that increasing the representation of women in the legislature by one per cent is associated with a corresponding increase in healthcare spending of 0.18 percentage points as a share of GDP.

Compared to representation in the legislature, there is little research on women in cabinets, despite the correspondingly greater concentration of power. In one of the few studies on substantive representation in the executive branch, Atchison and Down (2009) argue that this is an important research gap given the substantial policy control cabinets enjoy, especially in parliamentary democracies. Cabinets are the primary source of policy initiatives, while members of parliament from the governing party are only supposed to support the government's proposals (p. 4-5). Cabinets also control the legislative agenda, restricting the opposition's ability to pass their proposals. Therefore, if women promote female-friendly policies, we should see this effect in the acts of women cabinet members. Looking at 18 parliamentary democracies between 1980 and 2003, Atchison and Down

[3] Gender quotas are used as instrument for female representation in the legislature.

(2009) find empirical support that women in cabinet, more consistently than women in parliament, influence female-friendly policies.

Specifically addressing budget composition as an outcome, Mavisakalyan (2014) argue that identity, including gender, should show itself to the greatest extent in the work of cabinets, as their members are appointed and face fewer restraints on their actions than their parliamentary counterparts. Mavisakalyan (2014) tests the argument in 2000 across 80 countries in an instrumental variable setup by using the share of daughters that a national leader parents. The results show a significant association between the share of women in cabinet and healthcare spending, accounting for party ideology and type of government system. When discussing the exclusion restriction, Mavisakalyan (2014) argues that it is not plausible for women national leaders to affect the composition of the budget in ways other than through women's representation in the cabinet, given that the creation of the budget is a decision taken within the cabinet.

However, given the considerable influence national leaders have over their own political party and cabinet members, they should be in a position to steer government priorities, regardless of the genders in their cabinet. Furthermore, executives interact with parliament – the other institution with a say in the budget. Importantly, the gender of the chief executive has a direct impact on the behavior of members of parliament. Wahman, Frantzeskakis, and Yildirim (2021) argue that having a woman president has a symbolic intra-elite influence, creating momentum for increased empowerment and assertiveness for female parliamentarians. In Malawi, Wahman, Frantzeskakis and, Yildirim (2021) show that, as a consequence of a woman taking over the presidency, women MPs took the floor more frequently and engaged more visibly on economic issues.

Thus, and in contrast to the argument made by Mavisakalyan (2014), I posit that it is important to study the independent effect of the gender of the political elite due to the significant power concentrated in their hands.

2.3 The chief executive and spending priorities

Lienert (2005) systematically studies which institution – the legislature or the executive – controls the composition of the budget across different government types and institutional settings. This paper demonstrates that, especially in Westminster-type parliamentary republics, governments hold the overwhelming power to design "the shape and size" of the budget, among other important bill-initiation powers. Due to the weaker separation of powers in this type of system, "the executive essentially controls the legislature" and its committees (p.18), leaving very little room for changes to the budget on behalf of the parliamentarians.

Within the executive branch in parliamentary systems, the head of government is the key figure, usually also serving as head of the political party from which cabinet ministers are selected. In this type of system, even if ministers are individually responsible to the parliament, they also have a collective responsibility, acting as a single unit around the prime minister, to whom they are also accountable (Laver, Shepsle, and Calvert, 1994). Cabinet members are chosen directly by the chief executive and will be people the leader can trust (Stockemer and Sundström, 2019); furthermore, candidate selection theory predicts that elites seek similar people to themselves (Escobar-Lemmon and Taylor-Robinson, 2016). Therefore, there is little reason to believe that heads of government will choose those who fundamentally challenge their priorities, even if cabinet members have some autonomous agency. Therefore, we can reasonably expect that prime ministers will steer the annual budget priorities in this type of parliamentary republic. Importantly, women national leaders tend to occupy the position of prime minister more often than that of the president (Jalalzai, 2008).

Turning to presidential systems, executive power is concentrated in the president's hands. They are both head of state and head of government and are accountable to voters. The members of the cabinet serve as aides to the president and are personally accountable to the executive but are not elected (Martínez-Gallardo, 2010). In presidential systems, however, the separation of power is much clearer than in parliamentary systems, and legislatures can vote and directly amend the budget (Lienert, 2005). An extreme example is the US, where multiple committees in both chambers of Congress, and an independent, nonpartisan budget office, weigh in on the size and allocation of the budget (ibid). Empowered MPs, directly accountable to citizens, also have an incentive to impress their constituents with their actions as they look towards re-election, especially when they come from an opposition party (Mechkova, Lührmann, and Lindberg, 2018). Thus, presidents in this type of system can face

opposition in trying to advance their priorities. Despite the strong potential for counter-balancing, however, the budget proposal still comes from the executive branch, allowing the president to try to finance their prioritized policies, even if they might need to negotiate parts of the budget. Research shows that, by and large, presidents can advance their political agendas in both the legislature and media, especially when it comes to domestic politics (Edwards III and Wood, 1999).

Finally, in semi-presidential systems, the process of adopting budgets varies significantly depending on multiple factors such as the electoral system, constitutional rules, and whether the government is in the minority or majority (Lienert, 2005). This makes it very difficult to generalize which institution has the greatest impact on budget composition. Nevertheless, across all types of institutional arrangements, chief executives set the government's primary priorities; they are also usually the public face of the government, actively communicating with voters during campaigns and during their time in office. Finally, the cabinet, led by the chief executive, always has a role in shaping the budget, even if its exact strength varies across systems.

So far, I have demonstrated the critical role chief executives play in designing budgets; more research emphasis on the chief executive is needed in gender and politics. This last theory sub-section considers more broadly why we should expect women national leaders to stand for women's priorities.

2.4 Women chief executives and substantive representation

Although the numerical presence of women in politics is increasing, women national leaders are still uncommon (Jalalzai, 2004, 2008a; Watson, Jencik, and Selzer, 2005). The literature has examined the specific obstacles women face when running for office (O'Brien, 2015; Murray, 2014; Verge and Astudillo, 2019; Jalalzai, 2010) and the symbolic importance of women occupying the highest office (Alexander and Jalalzai, 2020; Simien, 2015). However, we do not know that much about the policy effects of women in executive office post-election, particularly from a comparative perspective.

A comparative perspective could be lacking due to the relatively small number of women who have occupied national leadership positions. Nevertheless, the number of women – from various ideological backgrounds (Genovese, 1993) – is rising, particularly throughout the 1990s and 2000s (Jalalzai, 2010). Jalalzai (2010) summarizes that women leaders have had "transformative" effects in their societies even if they have not always led feminist policies. Jalalzai (2010) gives Gro Harlem Brundtland, former prime minister in Norway, as an example of a leader who pushed for feminist

policies, like appointing multiple women to her cabinet, while others such as Margaret Thatcher in the UK, or Indira Gandhi in India, did not lead a feminist agenda, even if they changed the course of their countries in many other ways.

Given the rarity of women in chief executive positions and the little research done on their behavior, we should examine two sets of questions when considering the larger implications of the descriptive-substantive link. The first is, given that women leaders typically come from the elite, will they be able and willing to represent the interests of women citizens (Escobar-Lemmon and Taylor-Robinson, 2016)? This issue is particularly relevant to the study of women national leaders, compared to lower-level politicians. It is not immediately obvious that women in the elite will enact policies that improve women's, either because of institutional constraints or other ideological priorities.

Therefore, healthcare may not be a priority for the elite, as that issue may be secured through private insurance for women politicians and the wealthier constituents they represent. Women in the highest offices typically have more education and greater privilege than women in the general population (Jalalzai, 2008). For example, research in India has shown that women politicians tend to represent the upper-middle class of the population (Mishra, 2000; Clots-Figueras, 2011), and this has policy consequences. For example, Clots-Figueras (2011) shows that, unlike Indian women legislators from the lower castes, women from upper castes do not support legislation to support other women, such as land and heritage reforms.

The second set of questions pertains to whether women have the resources to successfully implement the policies they support. As gender and politics scholars have noted, women still have to play by a different, more demanding, set of rules than men, both when running for office and after election (O'Brien, 2015; Murray, 2014; Verge and Astudillo, 2019). Women are faced with biased selection processes and organizational and institutional factors that produce unequal playing fields, holding women to a higher standard than their male counterparts (Verge and Astudillo, 2019). To overcome these biases, women need to be "exceptional" and have more experience and resources than male candidates to succeed (Verge and Astudillo, 2019; Murray, 2014). A general concern about women entering politics is that they do so as newcomers; as a result, they might not have the same networks to implement their policies as the men who have long occupied these posts (Escobar-Lemmon and Taylor-Robinson, 2016). Men have simply held executive posts with access to resources, such as male

homosocial networks (Bjarnegård, 2013), for longer (Franceschet and Piscopo, 2014). Therefore, it is an open question as to whether women in the executive would have the resources to implement their priorities. This history of male dominance leads some authors to discuss the executive as a gendered institution, where women are disadvantaged (for discussion, see Escobar-Lemmon and Taylor-Robinson (2016)).

However, there are several reasons why we should expect representation in the executive to improve the situation for women overall, specifically when measured by healthcare expenditure. Increasing the numerical presence of otherwise under-represented groups provides a unique opportunity to influence policy outcomes in the areas important for the represented groups (Phillips, 1995). Even if the success of policy change is not guaranteed, the presence of representatives from these groups still gives an opportunity to voice interests that would otherwise be absent (ibid).

Importantly, descriptive representation should matter the most when representatives are incorporated into the highest ranks of elected officials and the dominant coalition (Browning, Marshall, and David, 1984; Preuhs, 2007). Although the theory of political incorporation was built to explain racial representation in legislative leadership positions, it can also be applied to women in executive positions. Smith (2014) argues that for women's interests and needs to be met, their mere presence in government is not enough. Only when women take the highest leadership positions in municipal governance, with more relative power than other municipal institutions, can they implement women's priority policies. It should then follow that, given the power available to national leaders, we could expect women in those positions, if willing, to help realize the preferences of women as a group.

Even if we are concerned about women being newcomers or facing a constraining environment due to the gendered nature of institutions, we could still expect that the women who made it to the highest offices will have the resources to successfully implement policies. Looking at the empirical evidence from the executive branch, the research generally agrees. Although women lack numerical equality in the cabinet, those appointed are "power players" with the full capacity and resources to govern, and they do it as effectively as men (Escobar-Lemmon and Taylor-Robinson, 2016). Similar evidence comes from case studies on national leaders and executives at the local level, which I will discuss next.

An edited volume by Waylen and Waylen (2016) examines Chilean President Michelle Bachelet's two

terms in office, from 2006-2010 and 2014-2018.[4] The volume documents Bachelet's ambitious reformative agenda, including progressive policies for advancing women's sexual and reproductive rights (Sepulveda-Zelaya, 2016), and childcare (Staab, 2016) and healthcare reforms (Gideon and Minte, 2016). The volume reports the successes of the president's female-friendly agenda but also her difficulties in overcoming institutional constraints and powerful conservative opposition. One of the president's successes was the introduction of emergency contraception and sex education, all of which happened in the face of strong opposition from conservative groups, the traditional right-wing, and the Catholic church (Peña, Aguayo, and Orellana, 2012). Success was only made possible by Bachelet leveraging the full range of executive powers, including the Constitutional Tribunal (Sepulveda-Zelaya, 2016). One of the conclusions from this example is that, even in a very constraining environment, the executive can make meaningful changes when they wish so, even if policy success is not always guaranteed.

In another example, Jalalzai and Dos Santos (2015) explore whether the presidency of Dilma Rousseff in Brazil led to substantive representation for women. They find that the presidenta improved the presence of other women in high posts within her cabinet, but her record on feminist policies is mixed. Rousseff expanded existing policies to explicitly benefit women, particularly mothers, and families living in extreme poverty, but she did not attempt to radically change the course of politics or address controversial policies such as abortion (even if she privately supported it).[5] This finding might reflect that, above all, women elected to high office are politicians, constrained by party politics and concerned with winning an election (Norris and Lovenduski, 1989). Thus, they need to strategically assess which policies are realistically achievable, given the political environment; however, the opportunity for change is there.

For empirical clues about what to expect from executives in national office, we can also turn to studies on executives in local politics. The existing studies agree that women mayors are more likely to devote funding for policies prioritized by women (Holman, 2014; Funk and Philips, 2019; Smith, 2014). Specifically, Holman (2014) addresses healthcare expenditure, hospital funding, welfare programs for

[4] She previously served as Chilean Health Minister from 2000-2002 and Chilean Minister of National Defense from 2002-2004.

[5] Similarly, in the case of Chile, the president was most successful in policies that did not challenge the existing status-quo (Waylen and Waylen, 2016).

adults and children, housing programs, and childcare in the US between 2007- 2008. Smith (2014) operationalizes women's interests as funding for programs and services for youth, abused spouses, and childcare as shares of the funding allocated from the federal Community Development Block Grant (CDBG) program for 2006-2007. Finally, Funk and Philips (2019) compare spending by Brazilian mayors for traditionally female issues – education, healthcare, and social assistance – with funding for traditionally male issues – transportation and urban development. They find a decrease in prioritization of traditionally male issues when the mayor is a woman. [6] The evidence from subnational studies clearly indicates that a female executive can have a visible role in supporting women's priorities.

2.5 Summary and Hypotheses

This article argues that women's descriptive representation in positions of power will have substantive effects on governance. Based on findings from the literature, it is clear that women and men have different policy priorities and behave differently once in office. Consequently, I expect that the combination of women's numerical representation and political incorporation will advance women's policy priorities. In this paper, expenditure for healthcare expenditure is chosen as a proxy for a concrete policy output prioritized by women at elite and citizen levels. As key decision-makers in the process, having a female chief executive should increase healthcare expenditure, relative to military, education, and non-governmental healthcare expenditure. This effect should be present only when women occupy de-facto positions of power and not largely ceremonial offices.

3. Empirical Analysis

3.1 Data and empirical strategy

The dependent variable in the study is measured with the indicator Domestic General Government Health Expenditure as a percentage of GDP; data is available from 2000 to 2016 from the World Bank (World Bank, 2014). Public expenditure consists of recurrent and capital spending from government budgets.

Healthcare expenditure varies most clearly across countries, given that healthcare systems are products of national governmental policies. Government finances also trump private investments in most

[6] Data used covers more than 5,400 municipalities between 2005 and 2012.

countries (see Figure 9 in the Appendix). Even in countries like Sweden, where healthcare is mostly run at local and regional levels, research shows that policy changes introduced by the national government have more substantive effects on healthcare outputs than reforms at local levels (Anell, 2005). Therefore, country-level analysis is appropriate to understand the drivers of spending increases. Finally, the data used in the analysis is longitudinal and allows us to compare how representation changes affect the outcome variable when holding all other country characteristics constant.

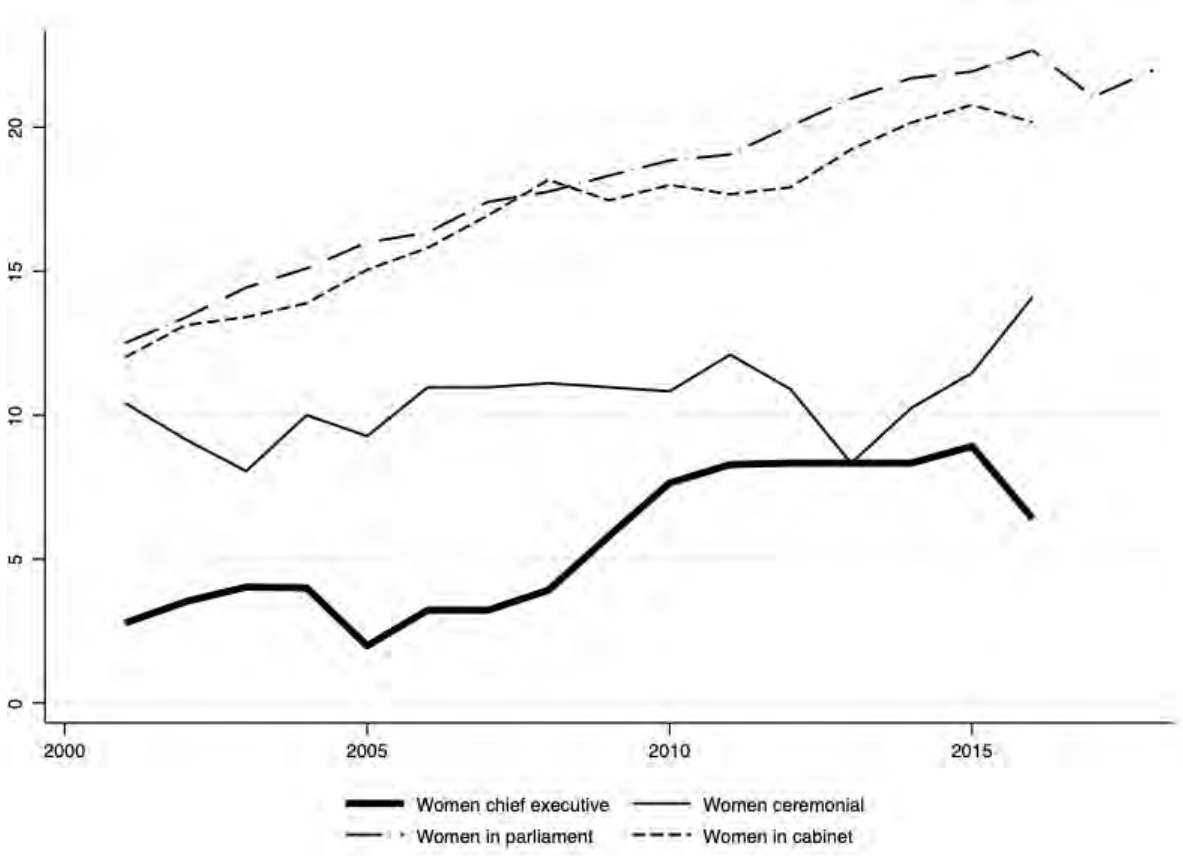
As a robustness check, I also use a series of placebo outcomes; these are other governmental and non-governmental expenditures that are not related to the leader's gender. Demonstrating a non-significant relationship between those placebo measures and the leader's gender would help rule out the hypothesis that "all good things go together" and enhance our confidence that healthcare is a special priority for women leaders. The first placebo outcome is External Health Expenditure as a percentage of current health expenditure (also from the World Bank). This outcome refers to all foreign financial transfers through non-governmental organizations or other ways. I also compare the results with military expenditure as a percentage of GDP, as previous research shows that defense spending is a lower priority for women than men. The final placebo outcome is the education budget, a social expenditure prioritized by both genders (Clayton et al., 2018).

The main explanatory variable in this study is the gender of the de-facto national leader (Nyrup and Bramwell, 2020). Figure 1 shows how the number of women leaders has changed over time (thick black line in the graph) compared to the numerical presence of women in other national posts. The share of women in ceremonial positions of power (e.g., vice-president or head of state when the de-facto leader is the head of government) is depicted with a thin line. The graph also shows the share of women members of parliament (dash-dot line) and women cabinet members (dash line). Data is shown for 2000-2016, drawing on Nyrup and Bramwell (2020), except the share of women in parliament, which comes from the V-Dem data set (Coppedge et al., 2020).

The trends for representation in cabinets and parliaments are similar; the numbers gradually increase to around 20 per cent in the most recent years. The share of women in ceremonial positions remains between 8 and 10 per cent, reaching 14 per cent in 2016. However, the trends in electing women as chief executive are somewhat different. In the early 2000s, women executives did not exceed 5 per cent globally, substantially lower than the share of women in other positions of power. After 2010,

women-led countries comprise around 7-8 per cent of all countries. The average share of women national leaders for the analyzed period (2000-2016) is 5 per cent, and 36 countries in total have had a woman as leader. The full list of countries is available in Table 3.

Figure 1: Share of women in national-level institutions.



Data: WhoGov and V-Dem

This low number demonstrates the obstacles facing women in attaining national leadership positions (Jalalzai, 2008) and presents a substantive methodological challenge to estimate the difference women make once elected. The biggest issue with having such a low number of women leaders is the limited information available across other covariates, potentially resulting in large standard errors. Another key obstacle to causal inference is that the countries that elect female leaders may incidentally also be countries that prioritize women's issues; thus, some observed or unobserved factors might explain both variables. For example, richer, more gender-equal countries may choose women leaders and invest in their healthcare systems. To account for that possibility, the next section discusses the types of countries present in my dataset.

Furthermore, to overcome the low numbers of women leaders and the resulting potential selection problem, I employ different methodological strategies as advised by the literature. First, I use matching methods, allowing me to select control units that resemble the treated units on a set of important observed characteristics (Stuart, 2010). In this specification, the treated units are the countries that have had a woman chief executive, and the counter-factual cases are states that have only had male leaders. This strategy improves the validity of causal inference in observational studies and decreases the dependency on model selection (Imai, Kim, and Wang, 2018). I use the methods developed by Imai, Kim, and Wang (2018) and Kim et al. (2020) specifically for TSCS data to select a set of control units similar to the treated units in terms of potential confounders and treatment history.

Second, I compare the results with OLS regression estimates, where I account for the most likely confounders, described in the next sub-section. The models include country-fixed effects to account for time-persistent unobserved trends that might drive dependent and independent variable changes (such as culture, religion, geography). Given that country-fixed effects is a strict model (Plümper, Troeger, and Manow, 2005) and that there is little variation in the main independent variable, false-negative results may be likely. To account for that possibility, I also estimate OLS regressions with region-fixed effects as a robustness check. Across all models, I cluster the standard errors by country to mitigate issues with panel-level autocorrelation. Further, tests with year-fixed effects account for time-trends that may determine the outcome and explanatory variables simultaneously.

The country- and year-fixed effects are identical to using a difference-in-difference approach (see Clayton and Zetterberg (2018) for a similar application). We can isolate the changes in government

spending that coincide with a woman chief executive assuming office. One note on using country- and year-fixed effects together is that these types of models are quite strict, wiping out a lot of the variation, potentially increasing chances of a false negative (Mummolo and Peterson, 2018). However, on average, they should produce unbiased estimates and, coupled with the other estimation strategies, will strengthen the confidence in the results.

As a robustness check, I also estimate all main models using the jackknife re-sampling technique to see if the results are stable when omitting each country in sequence, thus mitigating concerns that a single case is driving the results. Finally, I also compare the effects of the gender of a country's de-facto leader on healthcare outcomes with the effect of a woman being in a purely ceremonial position. To code that variable, I use the data from Nyrup and Bramwell (2020) to see which countries have had a woman holding a ceremonial leadership office (i.e., head of state/government, vice-president, etc.).

3.1.1. Confounders

The relationship between women's descriptive and substantive representation could be driven by many observed and unobserved factors. To the best of my ability, I account for those factors that I see as most likely confounders.

Economic development is the first such factor, as countries with greater resources may invest more in their healthcare systems while coincidentally electing women in higher numbers. To account for that, I use per capita GDP data from the Maddison Project (Bolt and Zanden, 2014), accessed through the V-Dem data set.

Democracy is another potential confounder as countries with free and fair elections tend to out-perform non-democracies in terms of healthcare outcomes (Wang, Mechkova, and Andersson, 2018). Regime type is also related to the extent to which women's rights are protected and women are represented in government (Wang et al., 2015).[7] To account for that, I use V-Dem's index of free and fair elections (Coppedge et al., 2018).

[7] Note that this finding is not universal, as governments under right-wing and military governments (Argentina, Pakistan, Peru) or governments in highly unequal societies (Jorna, Morocco) have also adopted quotas and some gender-equal policies (Htun and Weldon, 2010).

Ideology is one of the best explanators of representation, as political parties are the primary gatekeepers in the recruitment process for women (Kittilson, 2006). Previous research has shown that left governments tend to appoint more women (Goddard, 2018). Relatedly, some "feminine" issues, like healthcare, have become partisan, with left-wing governments embracing their protection, while right-wing governments endorse the traditionally male issues (i.e. the military) (Winter, 2010).[8] Generally, left-leaning governments are more likely to devote greater resources to healthcare.

The cultural explanation (Inglehart et al., 2003), or the extent to which countries are gender-equal, could also influence whether women are elected to positions of power and whether they prioritize political issues that women support. Societal gender attitudes are related to the number and type of positions women receive in cabinets (Goddard, 2018). The explanation for that finding is that societies where gender equality is more valued would care more about the composition of representative institutions. I use two variables as proxies for gender equality: women civil society participation and the share of women in parliament (Coppedge et al., 2018).

Corruption is a major barrier women need to overcome to be elected to office (Stockemer and Sundström, 2019). As newcomers, women are not seen as "trustworthy" by male elites with secretive tasks in high corruption environments (ibid). At the same time, corruption at elite levels could significantly influence the budget towards sectors that benefit politicians. To account for the influence of corruption, I use V-Dem's Political Corruption Index, a comprehensive measure that taps into both petty and grand corruption (Coppedge et al., 2018).

Finally, the type of government system also determines the composition of institutions. Presidential systems are argued to be more representative as the whole population elects a president, while a prime minister is chosen by a parliament (more limited selectorate) (Verge and Astudillo, 2019). Consequently, more representative systems could also result in higher welfare spending. Presidential systems are also regarded as more likely to appoint women and people from marginalized groups to positions of power within the government. I use the data and definitions developed by Cheibub, Gandhi and Vreeland (2010), accessed through WhoGov, to account for this potential confounder.

[8] See also research from Latin America (Schwindt-Bayer, 2006) showing that partisanship explains bill co-sponsorship in terms of healthcare and education.

3.2 Results

3.2.1 Describing the data

The analysis starts by exploring the countries that have chosen women leaders, especially as those factors may also drive greater healthcare expenditure. After that, we will consider a few specific country examples to gather initial anecdotal evidence about the hypothesized relationship between domestic healthcare and women's representation in the highest offices, and consider whether the hypothesized correlation is plausible when looking at the available data.

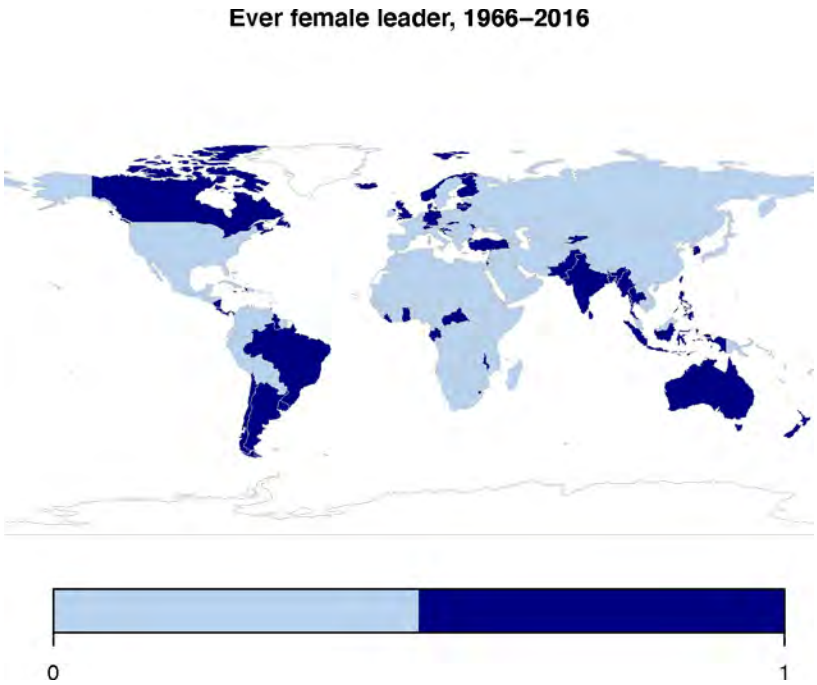
Figure 2 shows a world map, noting whether a country has had a woman de facto leader (as coded by WhoGov) between 2000 and 2016. The countries that have had female national leaders span multiple regions, including: Argentina, Brazil, Chile from Latin America; Liberia, Malawi and South Sudan from sub-Saharan Africa; Iceland, Germany and Norway from Western Europe; Moldova, Slovakia, and Lithuania from Eastern Europe; Bangladesh, South Korea, and the Philippines from Asia and the Pacific. At first glance, it is also clear that there are countries from multiple regime types and level of economic development.

Previous research also indicates that the type of countries that elect women, and adopt women-friendly policies, have changed over time. While nowadays, the countries with women presidents and prime ministers are primarily from relatively rich, liberal democracies with high state capacity, women executives used to come from poorer and lower state capacity countries (Piscopo, 2020). These include countries from South and Southeast Asia and Latin America – often countries with had high rates of instability (Piscopo, 2020; Jalalzai, 2008). Thus, it is helpful to study women's representation across time to capture the different type of societies that have had women leaders.[9]

When analyzing the effects of having a female leader, one important concern is that countries that elect women to high positions of power might do so across all institutions. Thus, it would be impossible to distinguish which factor is driving changes in budget composition.

Figure 2: Map showing whether the chief executive has been a woman, 1966-2016

[9] Figures 10 and 11 in the Appendix also map the share of women in cabinet and parliament respectively in 2016, allowing us to get an idea of the geographic distribution of representation in the world.



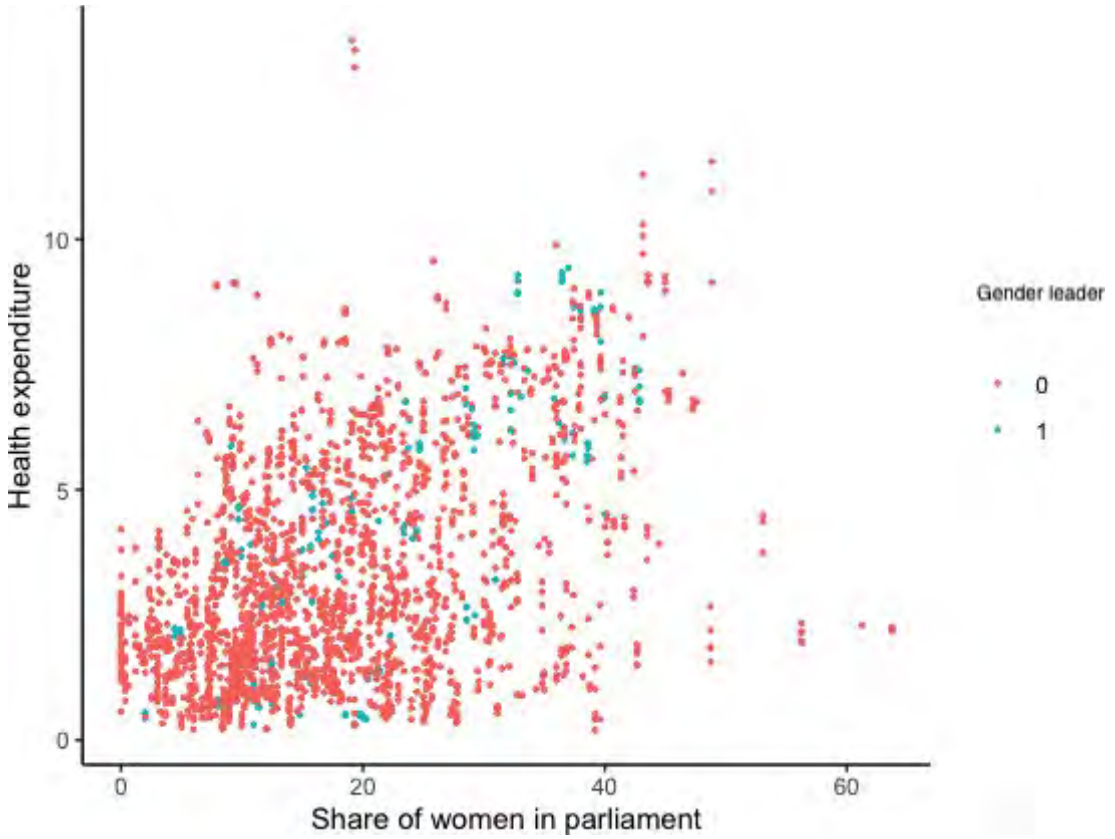
Data: WhoGov.

To address that concern, let us look at the distribution of the main variables of interest in Figure 3, which is a scatterplot showing the interaction between the Gender of the Chief Executive (blue dots if the executive is a woman, red for a man) and the Share of Women in Parliament (x-axis) on Health Expenditure as a Share of GDP (y-axis).[10] The figures reveal that countries with more women in parliament also have greater healthcare expenditure. Importantly, although the number of women national leaders is not large, the observations are not clustered only on one side of the graph. Instead, we see women leaders at all levels of healthcare expenditure and share of women in parliament.

As a final step in the descriptive analysis, let us take a closer look at a few concrete examples, offered in Figure 4. The selected countries span a range of incomes classes, geographic regions, political ideologies, and duration of executive tenure. Each panel shows the time-series trends in domestic healthcare expenditures (red line) from 2000 to 2016 for Argentina (4a), Chile (4b), Moldova (4c), Norway (4d), Sao Tome and Principe (4e), and South Korea (4f) respectively. A horizontal dashed line denotes the starting date when the chief executive enters office. Across all six countries, the tenures of female chief executives saw an increase, and all-time high, in healthcare expenditure for the examined period.

[10] The same plot is available for the Share of women in cabinet in Appendix in Figure 8.

Figure 3: Scatterplot showing the Gender of the chief executive (blue or red dots) and Share of women in parliament (x-axis) on Health expenditure as share of GDP (y-axis).



In four of the countries – Argentina, Chile, Moldova, and Sao Tome and Principe – the president or prime minister came from a left party (as coded by Beck et al. (2001)). However, the increase in spending cannot be attributed solely to partisanship; in all four cases, the women heads of state/government succeed male counterparts from the same political party. In the case of Argentina, the administration led by President Fernandez de Kirchner follows that of her husband Nestor Kirchner, and their combined twelve years of governing (2003-15) are often referred to as "Kirchnerism," due to the similar policies pursued (Cantamutto, 2016). However, the budget for healthcare under Fernandez de Kirchner rose from 4.2 to 5.6 after her first year of governing and continued to slowly increase during her two terms of office to reach Argentina' greatest recorded healthcare expenditure – 6.8 per cent. After she stepped down, the new male-led government decreased the healthcare budget by roughly one per cent.

Chile's Michelle Bachelet was the first woman to hold the presidency in her country, succeeding a male president from the same left party (Socialist Party of Chile). Despite an initial small budget decrease when Bachelet took over, over her two tenures (2006-09 and 2014-17), the healthcare budget increased by one per cent each time, reaching 5 per cent at the end of her second tenure, a historical high for the country. Both times, she was succeeded by a center-right male-led administration.

In Moldova, the female prime minister – Zinaida Greceanii – succeeded her colleague from the same left-wing party and was followed by a right-leaning head of government. During her two years in office, the budget for healthcare in Moldova reached its highest levels – 5.8 per cent of GDP. However, subsequent governments reduced it immediately after taking office.

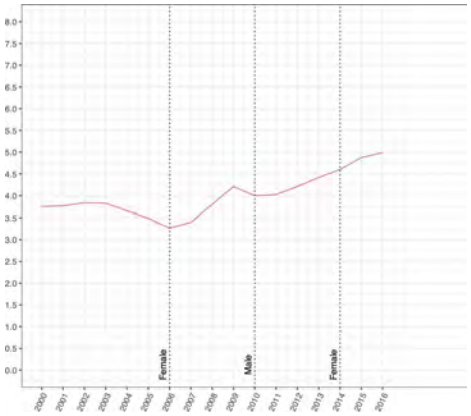
Maria das Neves (leading a left party) was the first female head of government in Sao Tome and Principle, entering office in 2003. During her first year in office, the budget for healthcare saw an increase from 3.6 to 5.8 per cent. The same left party continued to govern after Maria das Neves' tenure ended, but her successor sharply decreased the healthcare budget (from 5 per cent to only 0.5 of GDP), and expenditure remained at lower levels until the end of the examined period (between 1.5 and 2.5).

Finally, South Korea and Norway both had female leaders from right-wing parties, as coded by Beck et al. (2001). South Korea's leader, Park Geun-Hye, took office in 2013 as leader of the New World Party – The Grand National Party. She succeeded a male president from the same party but gradually increased the healthcare budget over her time in office.

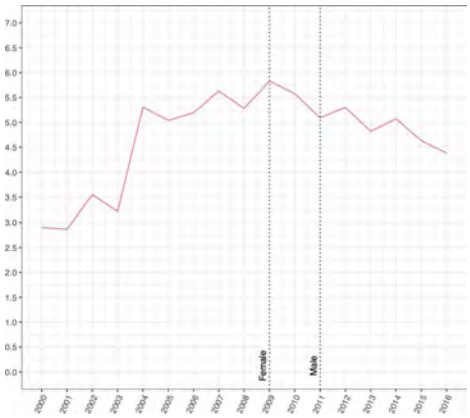
In Norway, Erna Solberg was a Prime Minister from the Conservative Party, and entered office in 2014. Her government took over a period of left-party rule. Despite the expectation that, as a right party, Solberg's government should shrink the public expenditures, the budget for healthcare over her first three years as prime minister increased from 7.5 per cent of GDP in 2012 (under the previous regime) to 8.9 in 2016 (the last year for which data is available).

Figure 4: Plots of Domestic Health Expenditure in 6 countries

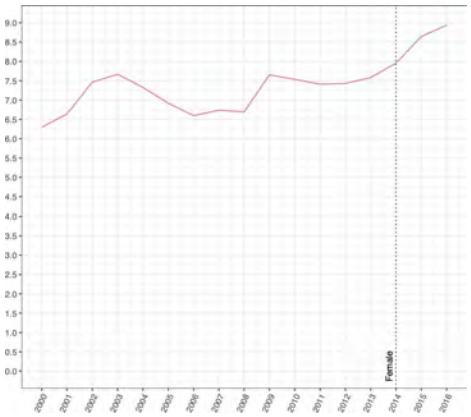
(a) Argentina



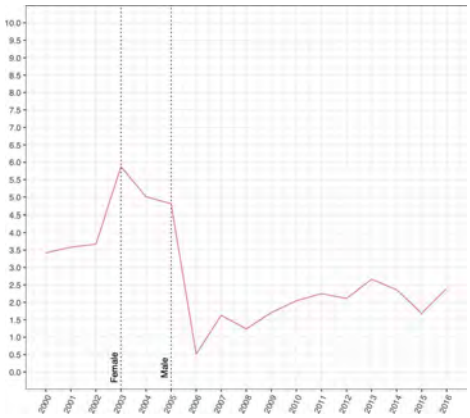
(b) Chile



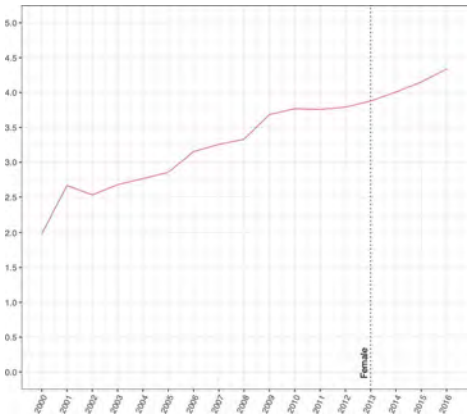
(c) Moldova



(d) Norway



(e) Sao Tome and Principe



(f) South Korea

3.3 Regression results

So far, we have only considered some descriptive statistics and cross-country correlations. This section provides more rigorous tests of the hypothesized relationship. Given that the true data generating process is unknown, I followed best practices to address concerns with endogeneity stemming either from reversed causality or omitted variable bias within the framework of regression analysis with observational data.

Table 1 summarizes the results from a series of OLS regressions, where the dependent variable across all models is Domestic Health Expenditure as a Share of GDP, and the main independent variable is the Gender of the Leader (head of state or head of government). I consider that, after assuming office, politicians will implement the budget composition changes according to their priorities the following year. This time-lag is consistent with similar research on the topic (Clayton and Zetterberg, 2018; Holman, 2014; Smith, 2014) and coincides with the patterns shown in Figure 4. Thus, all covariates are measured one year before the dependent variable.

Model 1 accounts for the most likely confounders – levels of economic development, democracy, corruption, and the share of women in parliament. The model uses country-fixed effects to account for certain slow-changing factors (such as culture or geography) that might influence both women's political representation and healthcare expenditure, while Model 2 adds year-fixed effects to account for global trends affecting both sides of the equation. The results from these models suggest a statistically significant positive relationship at the 0.001 level between the gender of the chief executive and healthcare expenditures. Thus, on average, women leaders budget about 4 per cent more for healthcare than their male counterparts.

The results are robust when adding other potential confounders – how active women are in civil society organizations (Model 3), the level of political corruption (Model 4), and the ideology of the head of state/government (Model 5). Model 6 uses the full set of control variables and year-fixed effects. It is encouraging to note that the coefficient for the gender of the leader remains statistically significant, even when estimating this very strict (inefficient) model, although the p-values drop to the 0.05 level.

Finally, Model 7 uses region-fixed effects as a robustness check, and the results remain largely

the same.[11] In this model, we can also add the system of government as a control variable - it is only meaningful to include this variable in a model without country-fixed effects, as it is time-invariant in most countries.

In sum, across all estimated models, the relationship between the gender of the chief executive and health expenditure is positive and statistically significant at the 0.001 level for most models, and at the 0.05 level under stricter models. In terms of effect size, the estimates vary depending on the model, where stricter models with full sets of control variables estimate around 2.7 per cent higher budgets for women leaders versus men. In contrast, a more liberal estimate (e.g., in Model 1) estimates effects at around 4 per cent. Importantly, even the conservative estimates suggest a substantive difference in healthcare budgets when comparing the two genders, with the effect being larger than one standard deviation (=2.2).

Among the covariates included in the analysis, the clearest other significant predictor of healthcare expenditure is the percentage of women in parliament. Across all models, a higher share of women in parliament is associated with higher budgets for healthcare. This finding aligns with previous research on the topic (Clayton and Zetterberg, 2018; Mechkova and Carlitz, 2020). The remaining coefficients are less stable but mostly go in the expected direction, e.g., in most models, higher economic development, lower corruption, freer elections, and more active civil society engagement are also associated with higher healthcare expenditure. However, the standard errors tend to be high for those variables, and the direction and significance vary depending on the model, so we should not draw any definite conclusions.

The next empirical test for the relationship between descriptive representation in the executive and substantive representation uses matching techniques. In this statistical procedure, each treated unit – countries that have had a woman as national leader – are compared to similar countries on other covariates who have only had men as head of state/ government. Figure 12 in the Appendix shows the distribution of 'treatment' across units and time; in this case, treatment refers to having a woman

[11] The variable uses the geographic regions of the world, as defined by the United Nations Statistics Division: Western Europe, Northern Europe, Southern Europe, Eastern Europe, Northern Africa, Western Africa, Middle Africa, Eastern Africa, Southern Africa, Western Asia, Central Asia, East Asia, South-East Asia, South Asia, Oceania (including Australia and the Pacific), North America, Central America, South America, Caribbean (including Belize, Cuba, Haiti, Dominican Republic and Guyana).

head of state/government. As discussed above, the country-years with male chief executives far outweigh those with women executives.

Table 1: Main analysis: OLS regressions on Health expenditure measured in t + 1 with main explanatory variable: Gender of the chief executive

	Dependent variable: Domestic health expenditure						
	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)	(1.6)	(1.7)
Gender leader	0.439***	0.329**	0.441***	0.440***	0.404***	0.284*	0.265*
	(0.120)	(0.118)	(0.121)	(0.122)	(0.117)	(0.109)	(0.110)
GDP per capita	0.034	-0.646**	0.038	0.038	0.060	-0.677**	0.159***
	(0.117)	(0.213)	(0.118)	(0.119)	(0.116)	(0.210)	(0.038)
Clean elections	0.111	-0.039	0.145	0.122	0.098	-0.022	0.364*
	(0.298)	(0.278)	(0.318)	(0.334)	(0.354)	(0.334)	(0.171)
Female legislators	0.032***	0.016*	0.033***	0.033***	0.033***	0.016*	0.031***
	(0.299)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.003)
Women CSO			-0.334	-0.366	-0.061	-0.561	0.022
			(0.636)	(0.655)	(0.627)	(0.636)	(0.202)
Political corruption				-0.171	-0.056	-0.145	-1.430***
				(0.521)	(0.533)	(0.554)	(0.161)
Left party					-0.018	-0.005	0.065**
					(0.045)	(0.042)	(0.022)
System of government							-0.011
							(0.035)
N	2189	2189	2189	2184	2101	2101	2091
R2	0.100	0.166	0.100	0.100	0.102	0.178	0.755
Country dummies	Y	Y	Y	Y	Y	Y	N
Region dummies	N	N	N	N	N	N	Y
Year dummies	N	Y	N	N	N	Y	N

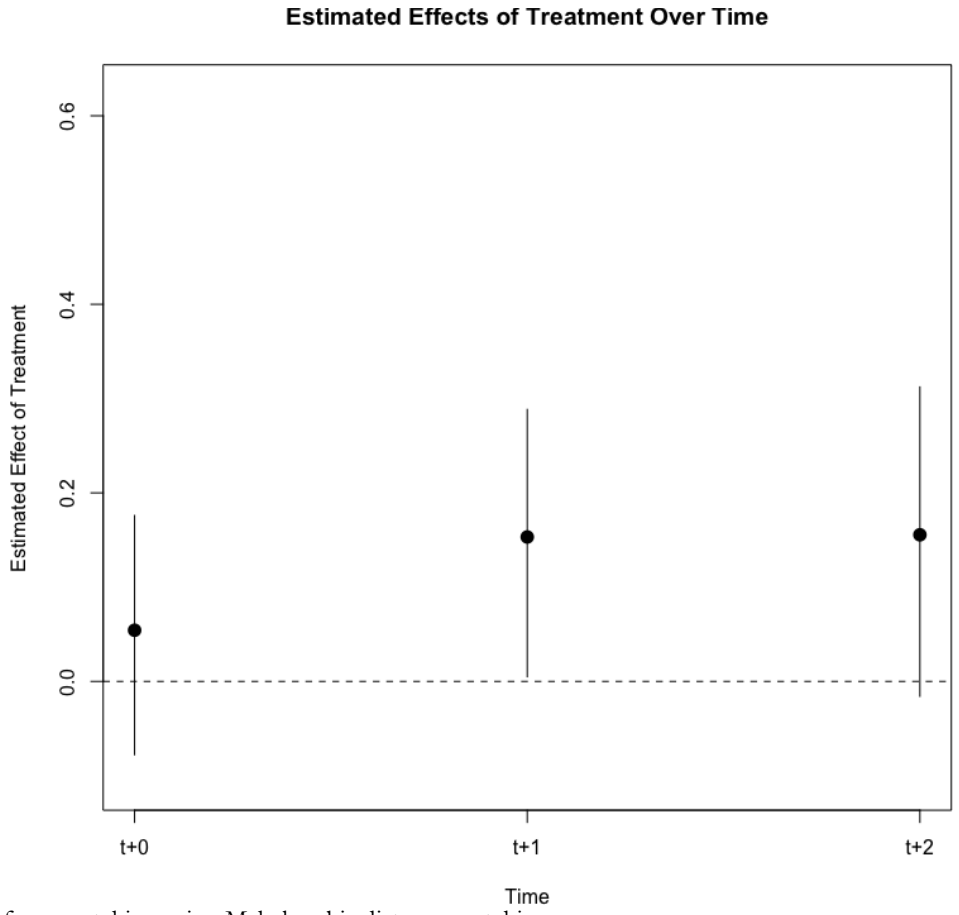
Standard errors clustered by country in parentheses:
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

I apply Mahalanobis distance matching to refine the matched sets, but the results remain substantively the same when using propensity score weighting. I set the maximum number of matches to ten (a control unit can be used only once), allowing me to match all treated observations with a control unit. The OLS regressions use a one-year lag but, as this time frame may be too short for the matching procedure, I condition the matching on two-year lags.[12] As a test, Figure 13 shows the balance of covariates used for matching – a useful rule of thumb is a value of 0.2. Thus, we can conclude that the matching works reasonably well, as we can find a match for each 'treated' unit from our control group.

[12] Imai, Kim, and Wang (2018) use the same lag structure and motivation in their replication example.

Figure 5 displays the results from the matching procedure, where we see the estimated coefficient for the Gender of the Chief Executive interact with the dependent variable Domestic Healthcare Expenditures at three different points in time. The first estimate is for the election year, and the second and third coefficients correspond to estimates for one and two years after the chief executive assumes office, respectively. Again, just as in the results from the OLS regression, we see a positive, significant coefficient, but this effect is significant only at t+1, as theorized above. In terms of the effect size, the estimates from the matching are similar to those in Models 6 and 7 with region-, country-, and year fixed-effects of around 0.2.

Figure 5: Coefficient plot with 95% confidence intervals for Gender of the chief executive, DV=Domestic health expenditure.



Estimates are from matching using Mahalanobis distance matching.

3.4 Robustness checks

The next sub-sections further interrogate the main findings by performing placebo tests, testing alternative estimation strategies, and assessing potential heterogeneity. This section aims to determine whether the statistically significant results obtained so far are spurious or significant.

3.4.1 Placebo tests

Arguably, one of the main sources of endogeneity in the relationship studied in this paper is that the general standing of women could be driving changes, both in women's electability and in social service expenditure. To address this concern, I employ two strategies: First, I compare the effects of having a woman de-facto leader to a woman assuming a ceremonial position of power, such as that of the vice-president. Comparing the results between these two offices will show that we only see changes in the dependent variable when women hold de-facto power. Second, placebo outcome variables – other social and military expenditure not expected to be correlated with the gender of the leader – are used to strengthen our confidence that women leaders will prioritize healthcare.

The results of a series of placebo tests are available in Table 5 in the Appendix. The first two models estimate the effects of having a woman in a ceremonial office on the size of the healthcare budget. As theorized, we do not find a correlation between a woman in such an office and healthcare expenditure.

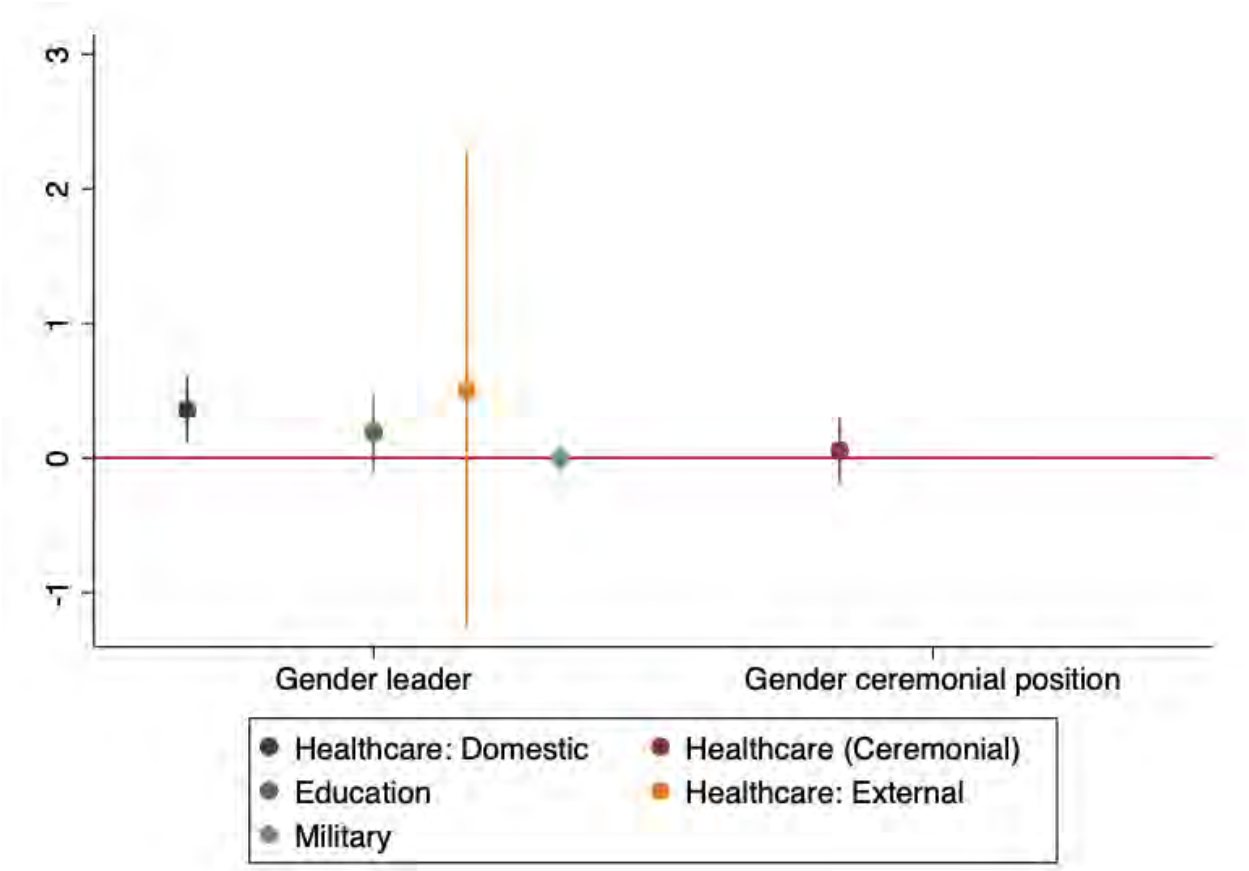
Furthermore, Models 3 and 4 estimate the relationships between the gender of the de-facto leader and education expenditure, with country-fixed effects (Model 3) and two-way fixed effects (Model 4). Model 5's dependent variable is military expenditure, and Model 6's is external, non-governmental healthcare expenditure resources.[13] Importantly, the results of the OLS regressions suggest that there is no statistically significant association between the gender of the leader and the placebo outcomes: education, military, or external healthcare expenditure.

Figure 6 summarizes the most important findings from the previous two sub-sections. The figure plots the coefficients (from left to right) for domestic healthcare expenditure (as estimated in Model 4, Table 1, with full control variables), education, external healthcare, and military expenditure. The

[13] The models for military and external healthcare expenditure with only country-fixed effects are not displayed but they show similar results, and are available upon request.

last coefficient represents the effects of the gender of ceremonial positions on domestic healthcare expenditure. The last four estimates are taken from Table 5 in the Appendix.

Figure 6: Coefficient plot with 95% confidence intervals.



The figure shows that, while there is a statistically significant association between the gender of the leader and domestic healthcare expenditure, none of the placebo outcomes show similar correlations. This lends credence to the theory that women chief executives prioritize women's interests.

3.4.2 Alternative model specifications

The goal of this section is to ensure that the significant results shown in previous sections are not simply due to modeling choices. Table 6 in the Appendix shows the additional robustness checks.

Models 1 and 2 are parsimonious, including only GDP per capita as a control variable (first with country-fixed effects and second with two-way fixed effects). The motivation for these simpler models

is to check for potential issues with post-treatment bias. That is, the gender of the leader might be correlated with some of the variables included in the x-axis. For example, as a result of symbolic representation (Simien, 2015) – i.e., seeing a woman national leader – other women citizens may be inspired to participate in civil society, leading to better representation of women's substantive interests. This is a plausible mechanism through which representation could work in practice. However, by controlling for women's civil society participation in the models, we might be washing away some of the indirect effects of having a woman leader. The same goes for other covariates, such as corruption or the quality of elections. As expected, the coefficients in these parsimonious models are around 0.4, closer to the other more parsimonious models in Table 1.

The results are also not driven by one country or outliers, as the tests with jackknife sampling show in Model 3 in Table 6 in the Appendix. This is an important robustness check, given the low number of countries that have had a woman chief executive.

The next models test how long the effects last over time. In Models 4 and 5, the dependent variable is measured two years after the executive assumes office (these models have country-fixed and two-way fixed effects, respectively). The same structure is followed in Models 6 and 7, which use the dependent variable at t + 3. Finally, Model 8 tests a time lag of four years.

The results are promising but suggest that the stability of the results dissipates over time. For the two-year lag structure, we note statistically significant coefficients for the gender of the executive at level 0.05 in the fixed-effects model. In the two-way fixed effects models, the coefficient is in the theoretically expected direction and approaching the traditional levels of statistical significance with a p-value smaller than 0.1. According to the standards, the coefficients for two-way fixed effects are not significant in the three-year lag model.

In a final robustness check, Model 5 in Table 6 uses domestic health expenditure as a dependent variable, measured at t-1. The fact that the coefficient for the gender of the leader is not significant when the dependent variable is measured in the past, gives us somewhat more increased in confidence to rule out reversed causality.

In sum, assuming the above-presented models are accurate, we can conclude that, on average, women national leaders devote between 2 and 4 per cent more to the healthcare system than their male counterparts. This statistically significant finding is robust to model specification and when controlling for covariates, such as government ideology, gender equality, and economic development.

3.4.3 Potential heterogeneity

In this sub-section, I assess the possibility that the results are stronger in certain contexts, thus helping us better understand the scope of the argument. This section will determine whether the effects of the gender of the chief executive vary according to the following three factors. First, I consider the political ideology of the chief executive, as it could be reasonable to expect that only left governments would prioritize social expenditure. The second factor is democracy; given that autocracies should not have a strong incentive to invest in public goods, as their re-election does not depend on keeping voters satisfied (Wang, Mechkova, and Andersson, 2018), the results in this paper may be constrained to democracies. Finally, previous research (Clayton and Zetterberg, 2018; Mechkova and Carlitz, 2020) shows that, as the number of women in the legislature increases, the share of the healthcare budget increases too. The models estimated in the previous sections also align with this finding. Therefore, I consider whether chief executives will only increase healthcare budgets with a high number of women in the legislature.

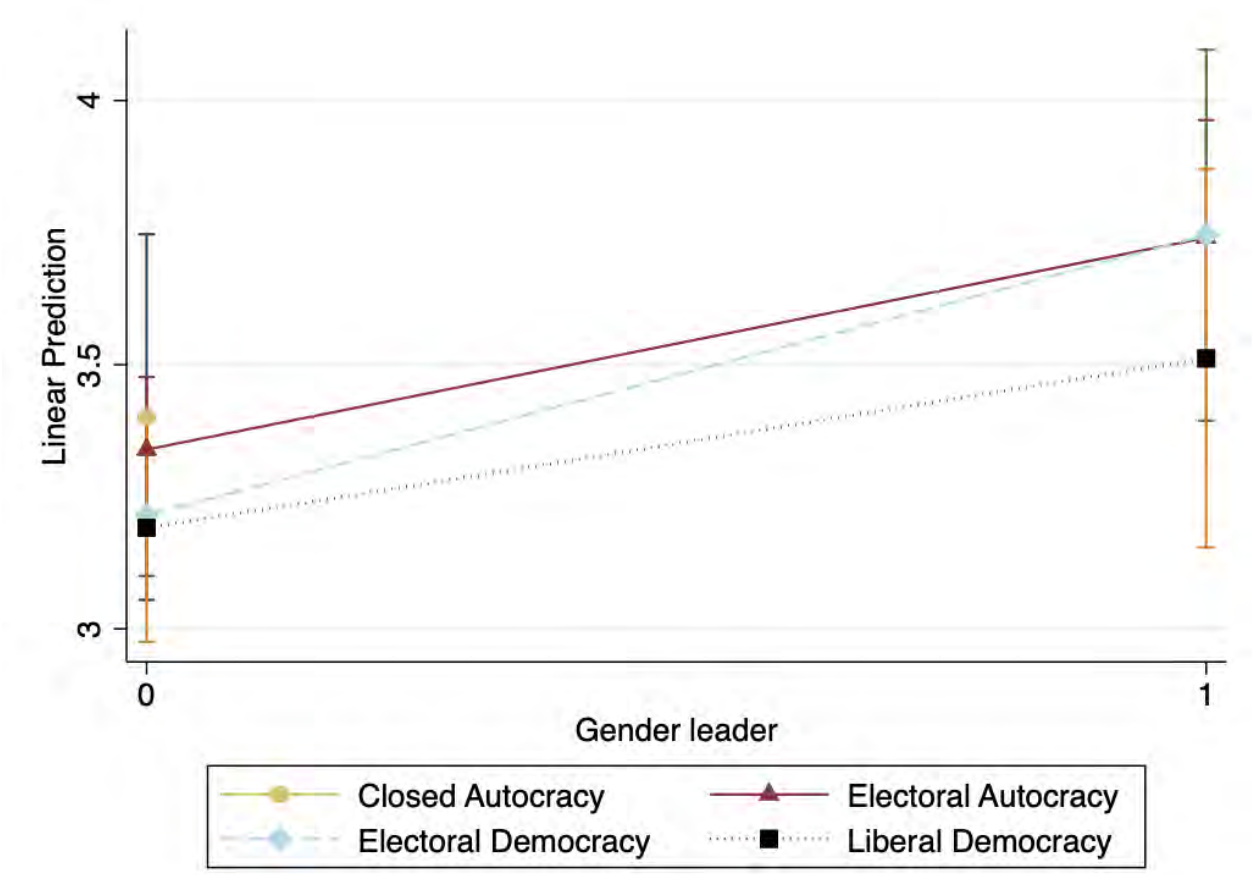
Table 7 in the Appendix depicts the results from interacting the gender of the chief executive with these three factors. In these three specifications, we do not find evidence that the effects of the gender of the leader vary by political party, level of democracy, nor number of women in the legislature.

Figure 7 plots the coefficients estimated in the regression analysis for the interaction term with democracy on domestic healthcare expenditure. For ease of interpretation, in this model, I substitute the measure for democracy with V-Dem's categorical Regime of the World Index. However, the results are substantively the same when using the V-Dem Clean Elections Index. Importantly, we see that, across all regime types, women chief executives spend relatively higher amounts on healthcare than men.[14] However, this difference is not statistically significant across regime types. Similarly, Figures 14 and 15 show that the effect size is larger when women chief executives come from left

[14] There are no women chief executives in Closed Autocracies.

parties and govern together with a parliament consisting of a large share of women. Yet, the difference is again not statistically significant.

Figure 7: Coefficient plot with 95% confidence intervals for Interaction between the Gender of the chief executive and Democracy.



DV=Domestic healthcare expenditure.

It is important to highlight that estimating interaction terms is demanding in terms of required degrees of freedom. Given the small number of 'treated' units in the sample, we should be careful when interpreting these negative results as they may simply result from not having enough data and too high standard errors. The effect size is particularly small when considering only center and right-wing parties (black line); more data is needed to understand how ideology and gender interact in this case.

4. Conclusion

Although the research on the link between descriptive and substantive representation is rich, several questions lend themselves to further analysis. For one, there is a call to move the research focus from 'critical mass' to 'critical actors' to study the leaders and politicians who advance women's rights and interests (Childs and Krook, 2009; Piscopo, 2014). The executive's actions are particularly under-studied, not least because of the smaller number of women who have shattered the highest of glass ceilings (Jalalzai, 2008). Given that representation guarantees a voice in politics, not an outcome (Wiliarty, 2010, p. 2), it is important to understand whether and what type of concrete policy outputs women can influence.

This paper aims to fill those research gaps by offering a systematic study of the effects of a woman national leader on spending priorities by considering a global sample over the course of 17 years. The statistical evidence from time-series cross-sectional analysis points towards a significant association between a woman chief executive and increased healthcare expenditure. Thus, this paper adds to the literature aiming to understand the potentially transformative effects of women positions of political power.

Future research could look more closely at the specific programs that get higher funding within the healthcare expenditure. An interesting question would be to examine whether, for instance, maternal and infant care is allocated additional resources as a result of improved representation. Future work could also examine the interaction between a politician's gender and other factors that affect the composition of the budget, both institutional – i.e., system of government and democracy – and individual – i.e., ideology or tenure track of national leaders. This paper moves in that direction, but more qualitative evidence is needed to make any definitive conclusions. Finally, while this study has focused on higher spending for healthcare, a future avenue to explore could be a focus on outcomes pertaining to women's rights, as well as whether other distinct changes come with a change in leadership, such as international alliances. These types of studies could give a better understanding of how the inclusion of women in positions of political power changes societies.

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Appendix

Table 2: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Outcome variables							
Domestic health expenditure	2,587	3.187	2.176	0.146	1.531	4.482	13.974
External health expenditure	2,163	9.080	13.696	0.000	0.166	12.158	86.195
Military expenditure	2,488	2.065	1.947	0.000	1.013	2.513	32.656
Education expenditure	1,724	4.530	1.779	0.787	3.250	5.492	14.059
Explanatory variables							
Gender leader	2,955	0.052	0.222	0.000	0.000	0.000	1.000
Gender leader ceremonial	2,405	0.114	0.317	0.000	0.000	0.000	1.000
Share women in cabinet	2,394	16.617	12.771	0.000	7.143	23.077	66.667
Share women in parl.	3,212	15.859	11.488	0.000	7.140	22.580	63.750
GDP per capita, log	2,928	9.001	1.216	5.855	7.986	9.983	11.959
Clean elections	3,451	0.520	0.326	0.000	0.222	0.841	0.985
Political corruption	3,446	0.508	0.301	0.005	0.209	0.787	0.974
System of government	2,931	1.080	1.164	0.000	0.000	2.000	3.000
Women CSO	3,451	0.651	0.230	0.044	0.502	0.843	0.962
Left party	2,647	1.294	1.301	0.000	0.000	3.000	3.000

Table 3: List of countries who have had women chief executive, 2000-2016.

Country name	Region
Bangladesh	Asia and Pacific
Burma/Myanmar	Asia and Pacific
Indonesia	Asia and Pacific
Philippines	Asia and Pacific
South Korea	Asia and Pacific
Sri Lanka	Asia and Pacific
Taiwan	Asia and Pacific
Thailand	Asia and Pacific
Croatia	E. Europe and C. Asia
Kyrgyzstan	E. Europe and C. Asia
Latvia	E. Europe and C. Asia
Lithuania	E. Europe and C. Asia
Moldova	E. Europe and C. Asia
Slovakia	E. Europe and C. Asia
Slovenia	E. Europe and C. Asia
Argentina	L. America and the Caribbean
Brazil	L. America and the Caribbean
Chile	L. America and the Caribbean
Costa Rica	L. America and the Caribbean
Jamaica	L. America and the Caribbean
Panama	L. America and the Caribbean
Trinidad and Tobago	L. America and the Caribbean
Central African Republic	Sub-Saharan Africa
Gabon	Sub-Saharan Africa
Liberia	Sub-Saharan Africa
Malawi	Sub-Saharan Africa
Sao Tome and Principe	Sub-Saharan Africa
South Sudan	Sub-Saharan Africa
Australia	W. Europe and N. America
Denmark	W. Europe and N. America
Finland	W. Europe and N. America
Germany	W. Europe and N. America
Iceland	W. Europe and N. America
New Zealand	W. Europe and N. America
Norway	W. Europe and N. America
Switzerland	W. Europe and N. America

Table 4: Countries included in the analysis.

Afghanistan Albania Algeria Angola Argentina Australia Austria Bangladesh Belarus Belgium Benin Bolivia Botswana Brazil Bulgaria Burkina Faso Burma/Myanmar Cambodia Canada Cape Verde Central African Republic Chile China Colombia Comoros Costa Rica Croatia Cuba Cyprus Czech Republic Denmark Dominican Republic Ecuador El Salvador Estonia Ethiopia Finland France Georgia Germany Ghana Greece
Guatemala Guinea Guinea-Bissau Haiti Honduras Hungary Iceland India Ireland Israel Italy Ivory Coast Jamaica Japan Kazakhstan Kyrgyzstan Laos Latvia Lebanon Lesotho Liberia Libya Lithuania Luxembourg Madagascar Malawi Mali Malta Mauritius Mexico Moldova Mongolia Mozambique Namibia Nepal Netherlands New Zealand Nicaragua Niger Nigeria North Korea North Macedonia Norway Pakistan Panama Paraguay Peru Philippines Poland Portugal Republic of the Congo Romania Russia Senegal Serbia Sierra Leone Slovakia Slovenia South Africa South Korea Spain Sri Lanka Sudan Sweden Taiwan Tajikistan Tanzania Thailand The Gambia Trinidad and Tobago Tunisia Turkey Turkmenistan Uganda Ukraine United Kingdom United States of America Uruguay Uzbekistan Venezuela Vietnam Zambia

Table 5: Placebo tests: Placebo outcomes in $t + 1$, with main explanatory variable: Gender of the chief executive and Ceremonial positions.

	Dependent variable: Expenditure for					
	Health (Domestic)		Education		Military	Health (External)
	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)	(3.6)
Gender ceremonial position	0.040	0.055				
	(0.127)	(0.122)				
Gender leader			0.263	0.192	-0.004	0.510
			(0.154)	(0.147)	(0.052)	(0.894)
GDP per capita	0.105	-0.629**	0.186	-0.389+	-0.026	-4.523**
	(0.115)	(0.207)	(0.186)	(0.232)	(0.373)	(1.709)
Clean elections	0.075	-0.041	1.234*	1.095+	0.331	4.593+
	(0.340)	(0.328)	(0.556)	(0.567)	(0.937)	(2.716)
Political corruption	-0.151	-0.302	1.134	0.881	-1.906+	6.607+
	(0.529)	(0.538)	(0.825)	(0.803)	(1.047)	(3.630)
Women CSO	0.000	-0.561	2.139*	1.881*	1.132	4.732
	(0.545)	(0.562)	(0.923)	(0.874)	(1.449)	(7.405)
Female legislators	0.034***	0.016*	0.012	0.002	0.004	-0.038
	(0.007)	(0.007)	(0.009)	(0.009)	(0.008)	(0.045)
Left party	-0.008	0.006	-0.012	-0.004	0.018	-0.145
	(0.043)	(0.040)	(0.031)	(0.031)	(0.021)	(0.241)
Constant	1.783	8.650***	-0.308	5.221*	2.269	34.040*
	(1.135)	(1.907)	(1.699)	(2.126)	(2.606)	(14.593)
R-squared	0.102	0.179	0.0613	0.104	0.0514	0.129
N	2152	2152	1381	1381	1979	2015
Country dummies	Y	Y	Y	Y	Y	Y
Year dummies	N	Y	N	Y	Y	Y

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Robustness checks: OLS regressions on Domestic health expenditure with main explanatory variable: Gender of the chief executive

	Dependent variable: Domestic health expenditure								
		$t+1$		$t+2$		$t+3$		$t+4$	$t-1$
	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)	(2.6)	(2.7)	(2.8)	(2.9)
Gender leader	0.407***	0.262*	0.260*	0.305*	0.198+	0.294*	0.182	0.238+	0.169
	(3.38)	(2.42)	(2.23)	(2.36)	(1.75)	(2.20)	(1.48)	(1.85)	(1.64)
GDP per capita	0.431***	-0.549**	-0.605**	0.188	-0.535**	0.240 *	-0.450*	0.263*	-0.714***
	(3.66)	(-2.87)	(-3.07)	(1.57)	(-2.84)	(2.00)	(-2.44)	(2.19)	(-3.56)
Clean elections			0.0173	0.0592	-0.0780	0.125	-0.0387	0.239	-0.0549
			(0.06)	(0.18)	(-0.25)	(0.36)	(-0.12)	(0.68)	(-0.16)
Women CSO			-1.010+	-0.300	-0.901+	-0.291	-0.888+	-0.387	-0.512
			(-1.86)	(-0.58)	(-1.91)	(-0.54)	(-1.84)	(-0.69)	(-0.91)
Political corruption			-0.529	-0.360	-0.549	-0.309	-0.535	-0.234	-0.751*
			(-1.13)	(-0.76)	(-1.19)	(-0.59)	(-1.05)	(-0.40)	(-2.53)
Female legislators			0.0159*	0.0321***	0.0130+	0.0309***	0.0119	0.0300***	0.0128+
			(2.22)	(4.57)	(1.84)	(4.24)	(1.60)	(4.01)	(1.91)
Left government				-0.017	0.004	0.001	0.0222	0.010	-0.035
				(-0.42)	(0.10)	(0.02)	(0.64)	(0.26)	(-0.98)
Constant	-0.668	7.549***	8.861***	1.452	8.293***	0.948	7.513***	0.741	9.771***
	(-0.64)	(4.61)	(4.83)	(1.28)	(4.93)	(0.83)	(4.55)	(0.64)	(5.16)
R-squared	0.0481	0.164	0.190	0.110	0.191	0.109	0 .186	0.103	0.192
N	2582	2582	2491	2410	2410	2405	2405	2401	2139
Country-FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-FE	N	Y	Y	N	Y	N	Y	N	Y
Jackknife SE	N	N	Y	N	N	N	N	N	N

t statistics in parentheses

+ $p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 7: Interaction terms. DV=Domestic healthcare expenditure.

	(1)	(2)	(3)
Gender leader	0.257^{+}	0.321^{+}	0.307
	(0.138)	(0.165)	(0.200)
GDP per capita	0.054	0.061	0.057
	(0.114)	(0.118)	(0.117)
Clean elections	0.100		0.104
	(0.356)		(0.356)
Female legislators	0.033***	0.034***	0.033***
	(0.007)	(0.007)	(0.007)
Women CSO	-0.045	-0.064	-0.061
	(0.628)	(0.633)	(0.629)
Political corruption	-0.050	-0.239	-0.080
	(0.535)	(0.532)	(0.537)
Left party	-0.060	-0.022	-0.018
	(0.121)	(0.045)	(0.045)
Gender leader × Left	0.358		
	(0.228)		
Electoral Autocracy		-0.061	
		(0.188)	
Electoral Democracy		-0.185	
		(0.200)	
Liberal Democracy		-0.209	
		(0.247)	
Gender leader × Electoral Autocracy		0.081	
		(0.203)	
Gender leader × Electoral Democracy		0.209	
		(0.249)	
Gender leader × Liberal Democracy		0.000	
Gender leader × Female legislators			0.004
			(0.012)
R-Squared	0.104	0.107	0.102
N	2100	2090	2100
Country-FE	Y	Y	Y
Year-FE	N	N	N

Standard errors in parentheses

$^{+}$ $p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Figure 8: Scatterplot showing the Gender of the chief executive (blue or red dots) and Share of women in cabinet (x-axis) on Health expenditure as share of GDP (y-axis).

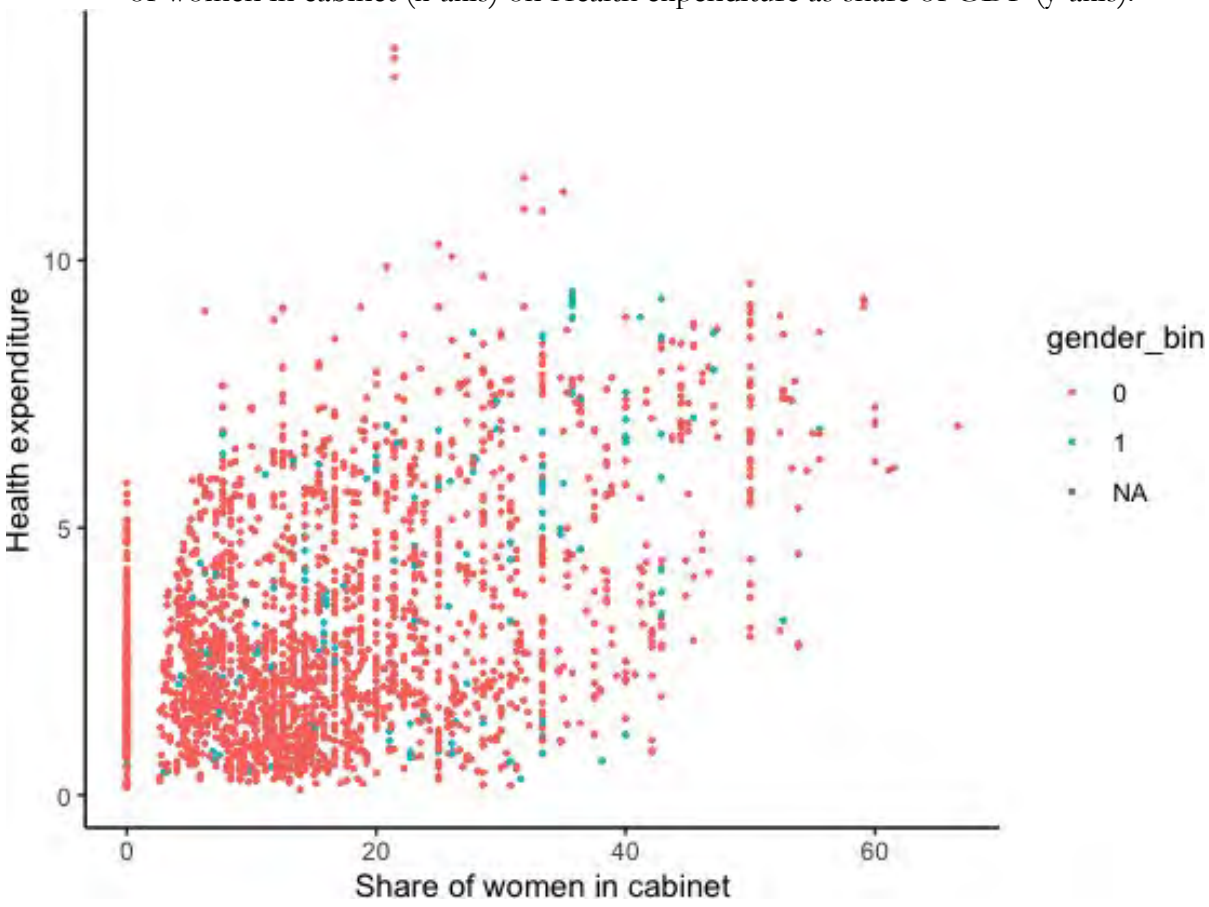


Figure 9: Health expenditure by financing source, 2019 or latest available. Source: OECD.

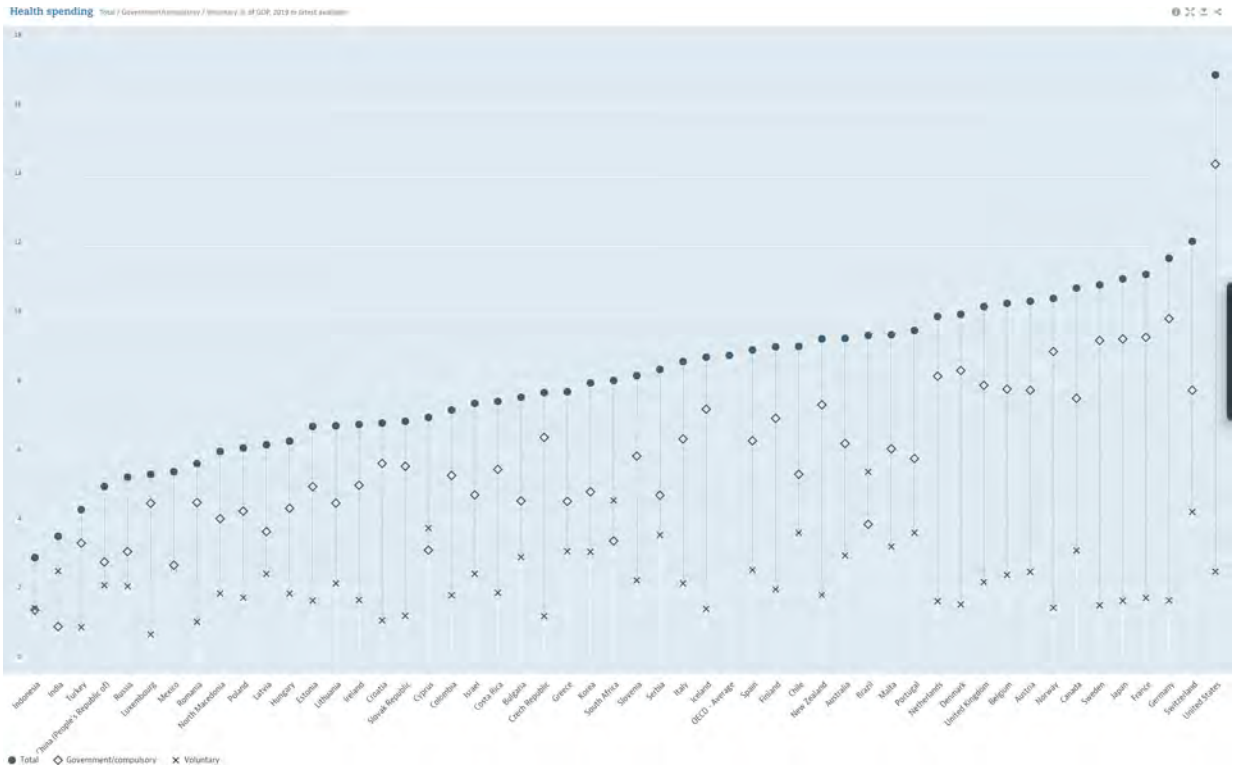


Figure 10: Map showing the percentage of women in the cabinet. Data: WhoGov.

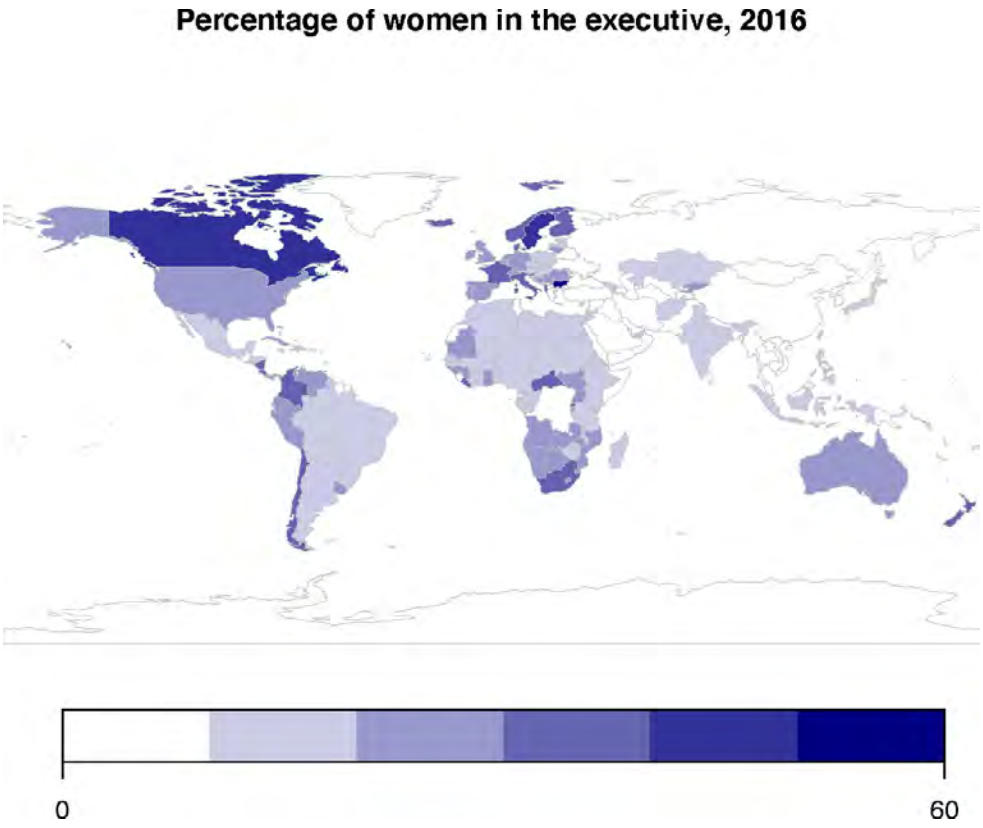


Figure 11: Map showing the percentage of women in parliament. Data: V-Dem.

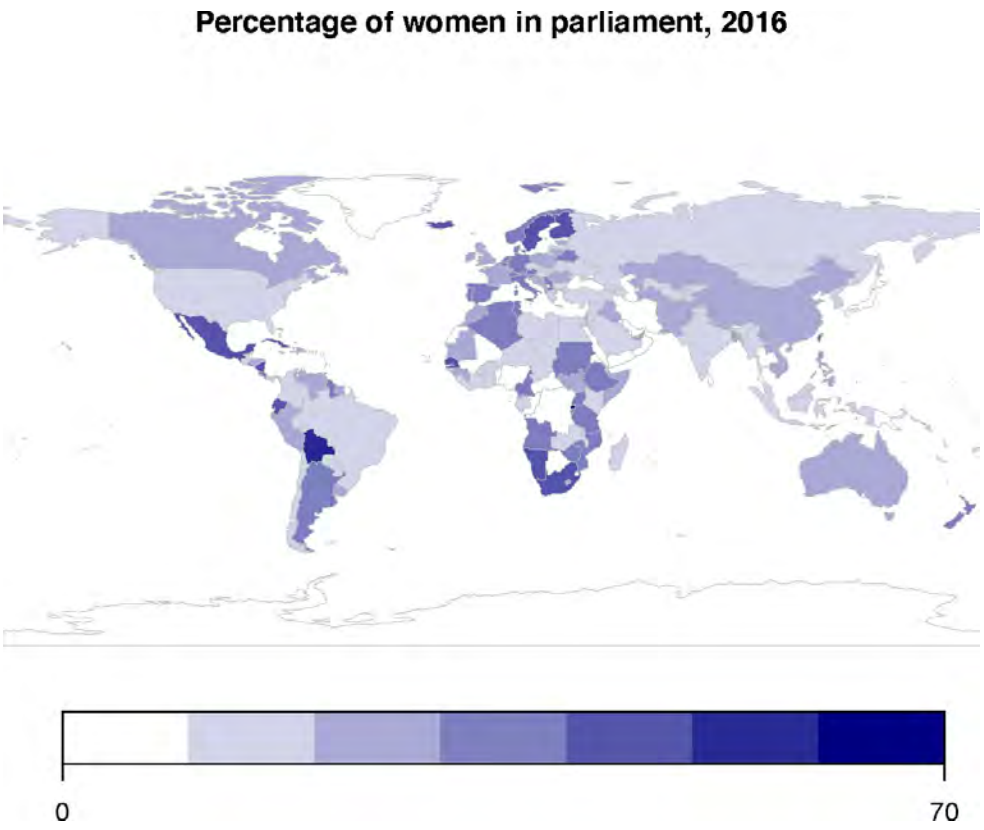


Figure 12: Distribution of the "treated" observations by country and time. Data: WhoGov.

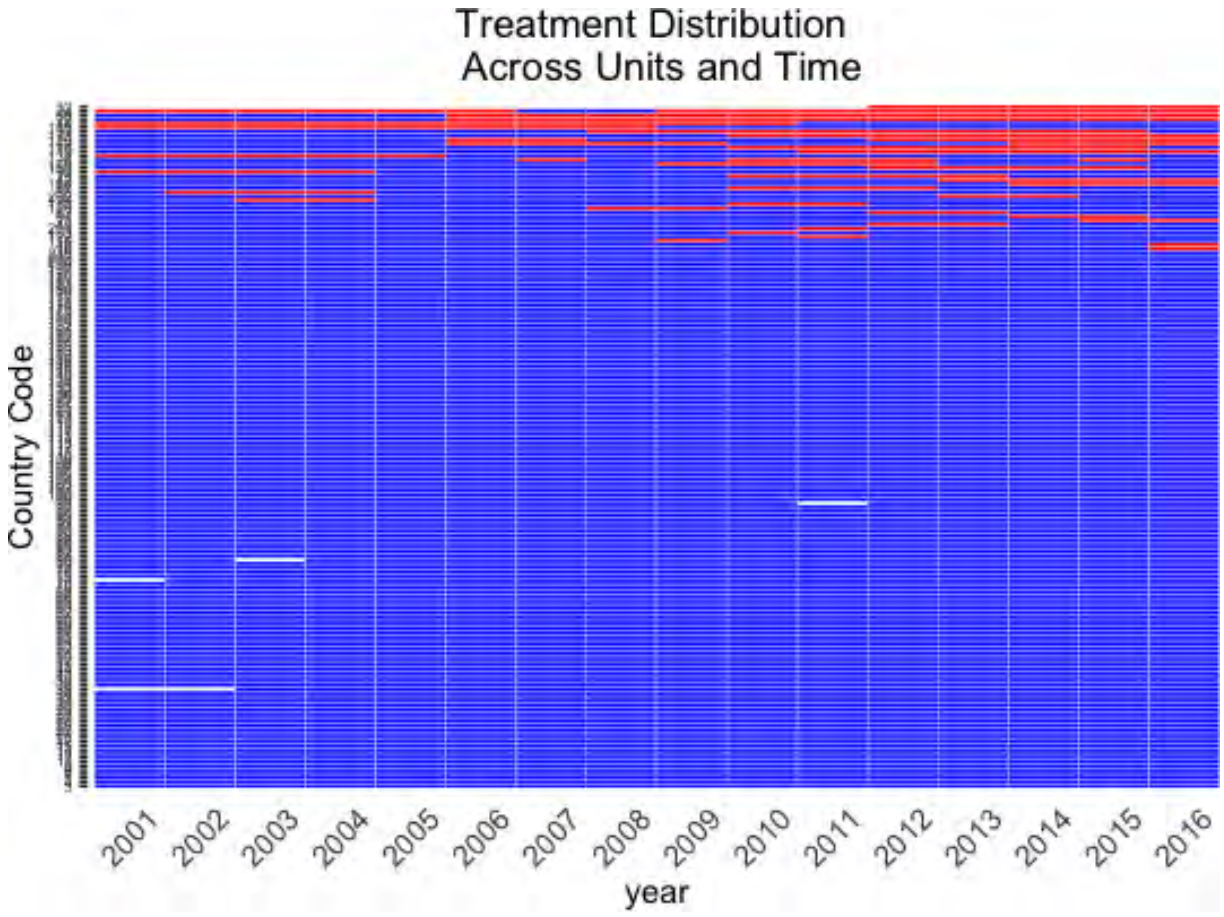


Figure 13: Balance of covariates used for matching.

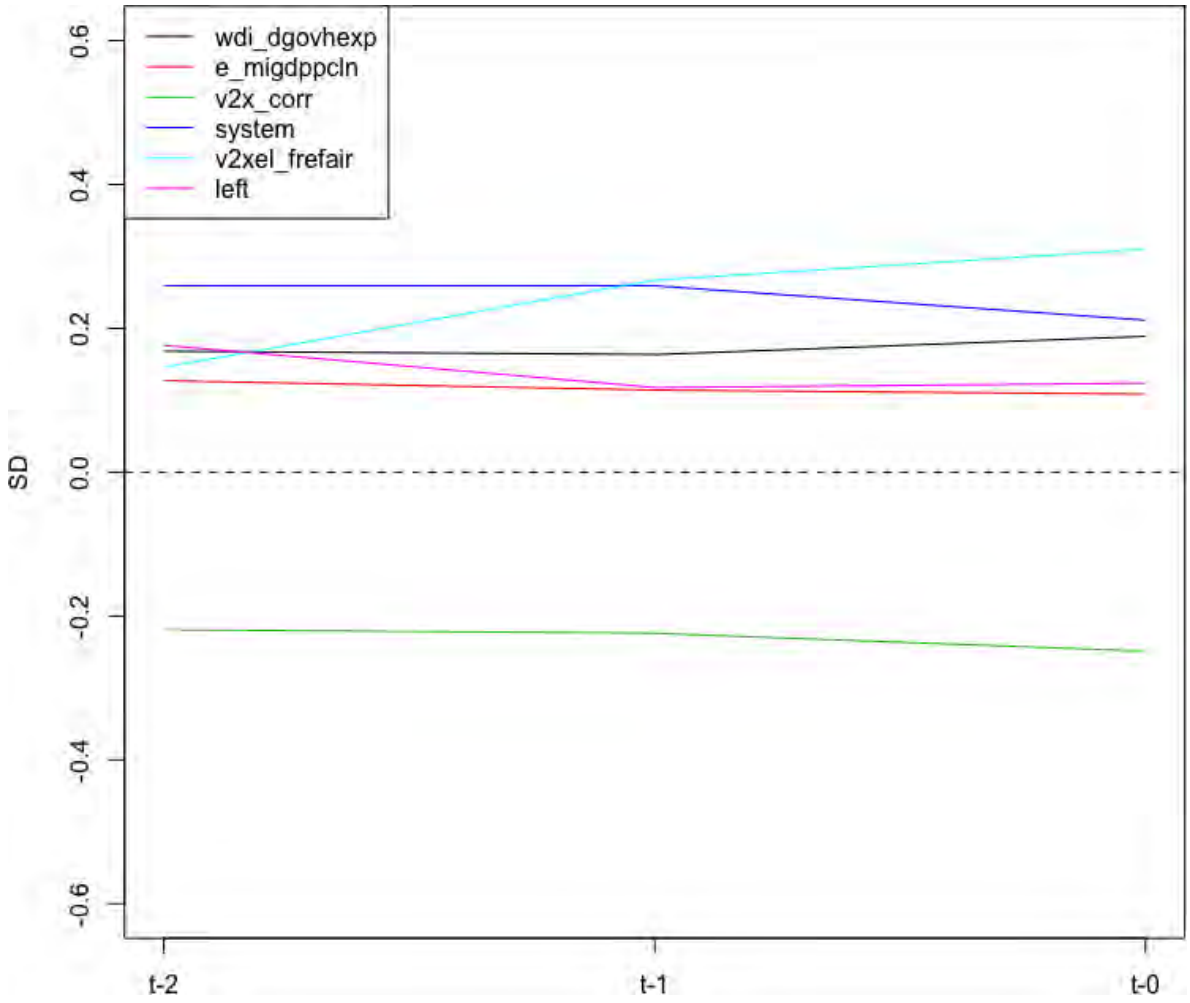


Figure 14: Coefficient plot with 95% confidence intervals for Interaction between the Gender of the chief executive and Ideology. DV=Domestic healthcare expenditure.

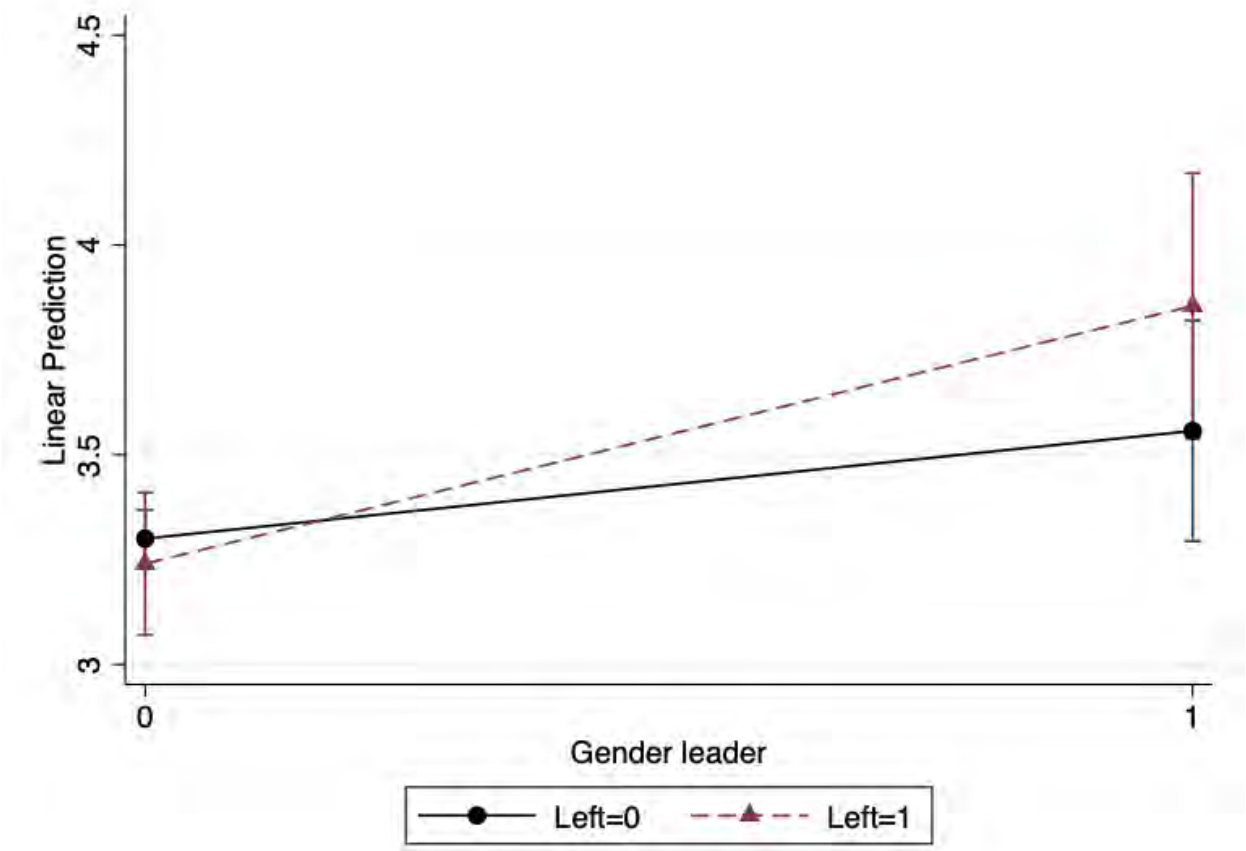
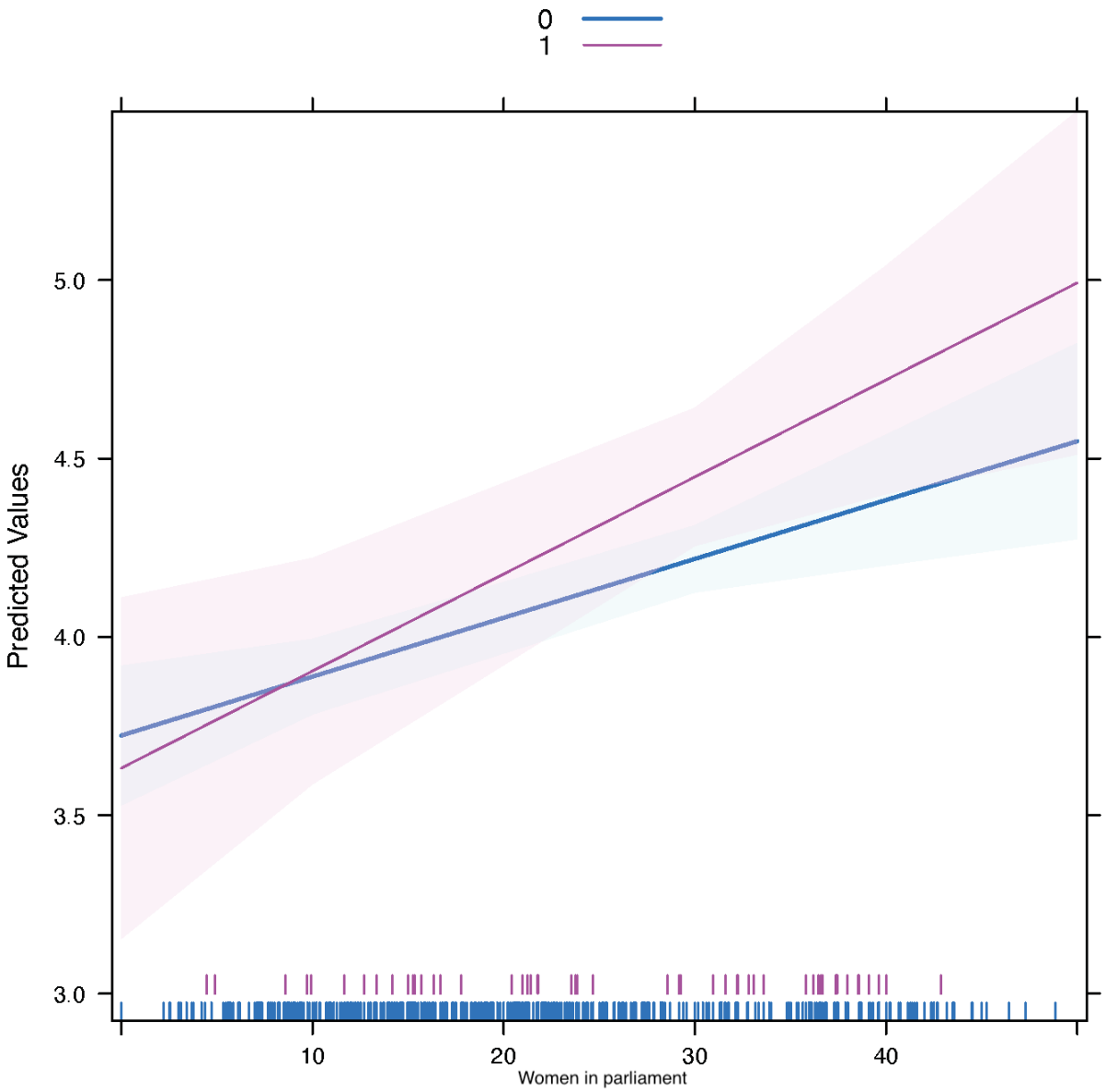


Figure 15: Coefficient plot with 95% confidence intervals for Interaction between the Gender of the chief executive and Share of women in parliament.



DV=Domestic healthcare expenditure.