The Descriptive-Substantive Link Beyond Democracies: A Mixed Methods Investigation of Women Cabinet Ministers in Non-Democratic Regimes

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Abstract

Existing analysis of the link between descriptive and substantive representation is largely limited to the role of women legislators, and literature that does examine the role of women cabinet ministers is limited almost exclusively to democracies. Given a significant proportion of the world's population live in non-democracies, and the growth of women's representation in such states, this dissertation seeks to uncover whether there is a descriptive-substantive link regarding women cabinet ministers in non-democracies and, if so, what this link may look like. This dissertation does so firstly by using quantitative methods, namely linear regressions and interaction effects, to uncover the links between the proportion of female cabinet ministers and a number of indicators of improved educational outcomes for the female population within the state. This dissertation then turns to three case studies, both past and present to explore how a selection of women cabinet ministers have utilisied their position to substantively represent women. Both of these methods uncover the existence and strength of the descriptive-substantive link regarding women cabinet ministers in non-democracies, finding that the appointment of women to cabinet can substantively improve the educational outcomes of women within such states. Case studies demonstrate the ways this can be done, namely forming coalitions with other women cabinet ministers and using the international legitimacy conferred upon them by their position in cabinet to join international initiatives to improve the lives and education of women and girls. Overall, this research contributes to existing literature regarding the descriptive-substantive link by providing evidence of its existence in non-democracies and by assessing how select women cabinet ministers have been able to substantively represent women despite the undemocratic nature of their state.

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1. Introduction

Cabinets are at the heart of policymaking in states across the world, yet as of January 2024, women comprised only 23.3 per cent of cabinet ministers globally (UN Women, 2024). While this is far from gender parity – estimations suggest we will have to wait until 2077 to witness this – this figure is the latest in the continual increase in women's appointment to cabinet around the world (Berevoescu et al., 2024). The growth of women's political representation, in both legislatures and cabinets, is typically closely associated with democracy, particularly by non-governmental international organisations such as the UN. The two are often considered mutually reinforcing, with democracy considered the best system of government to ensure the equal representation of women, and women's equal representation considered crucial to a truly democratic system (Piccone, 2017; UNDP, no date a). Furthermore, the connection between the presence of women in cabinet and improved representation of women's wider interests (also known as the descriptive-substantive link) is well established in democracies by numerous scholars but is rarely examined outside a democratic context (Atchison and Down, 2009; Nwankwor, 2021; Curtin, 2008; Whitford et al., 2007). Importantly, however, the increase in women's representation in cabinet is evident in both democracies and non-democracies – in fact as of 2024, the second highest level of women's representation in cabinet, roughly sixty-two percent, is found in the non-democratic Nicaragua (UN Women, 2024).

Subsequently, the notable increase in women's representation in cabinet in non-democracies poses an interesting question rarely tackled in the existing literature: can the descriptive-substantive link regarding women cabinet ministers also be observed in non-democracies? This is the question this research seeks to answer. It will do so firstly by outlining the existing literature on the subject to identify how this dissertation will contribute to discussions of the descriptive-substantive link. This section will also justify this research's focus on education policy and outcomes for women and girls. To assess the descriptive-substantive link on a global level, this research first uses quantitative methods to uncover general associations between the proportion of women in cabinet and a number of indicators of improved education for women. This section will also explore a sub-question: if the descriptive-substantive link can be observed in non-democracies, does it differ to the link observed in democracies?

To complement the general associations between women in cabinet and women's educational outcomes found by quantitative methods, this research will turn to three case studies to uncover some of the ways in which women cabinet ministers in non-democracies have substantively represented women's educational interests in both the present and the past. The conclusion of this dissertation will bring these quantitative and qualitative findings together, creating an overall picture of the existence and strength of the descriptive-substantive link in non-democracies.

2. Literature Review

2.1 Descriptive and substantive representation

The concepts of descriptive and substantive representation form the foundation of this research and are outlined in Pitkin's seminal work *The Concept of Representation.* Descriptive representation refers to representatives acting as a "substitute for the assemblage of the whole people", focusing on "what [representatives] are, or are like", rather than their actions (Pitkin, 1972: pp.80-86). Conversely, substantive representation focuses on how representatives use their position to "[act] for others" (Pitkin, 1972: pp.114-115). Thus, when applied to the representation of women, descriptive representation refers to the presence of women in government, while substantive representation refers to actions of representatives to reflect the interests of women in the wider population.

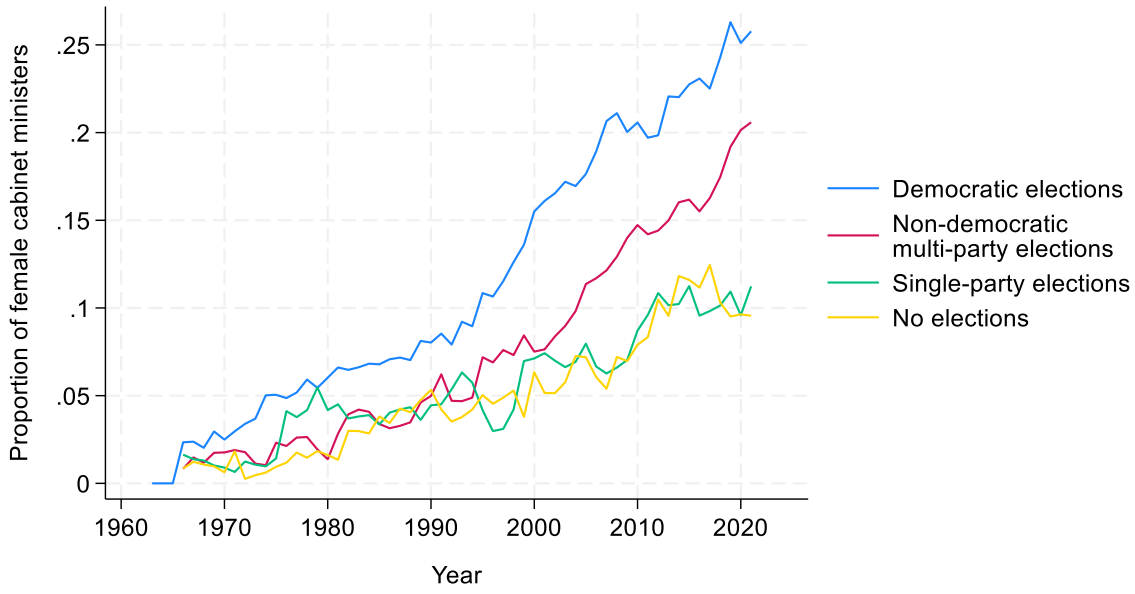
Since Pitkin's work, extensive literature has linked these two concepts of representation, particularly through the concept of "critical mass" (Childs and Krook, 2008: pp.485; Grey, 2002: pp.19). Critical mass theory suggests that women politicians are unlikely to have a significant impact on the introduction of women-friendly legislation until their descriptive representation expands beyond a "few token individuals" (Childs and Krook, 2008: pp.485). The merits of this theory are debated, particularly regarding its portrayal of critical mass as an almost instantaneous effect whereby substantive representation occurs at a particular level of descriptive representation and not at all below this level. Many instead argue this effect is graduated, with the effectiveness of substantive representation improving continuously as descriptive representation increases (for a detailed account of this debate, see Childs and Krook, 2008). Nevertheless, regardless of the debated nature of critical mass, there exists

a broad consensus in the literature that increasing numbers of women representatives has a positive effect on the implementation of women-friendly legislation (Beckwith, 2007: pp.36-42; Celis and Childs, 2008: pp.420; Kanter, 1977: pp.996; Cowel-Meyers and Langebin, 2009: pp.506; Reingold, 2008). The typical explanation for this is that, due to their shared experiences with women in the population, women representatives bear greater understanding and prioritisation of women's issues (Cowell-Myers and Langebin, 2009: pp.492). Greater numbers of women in government are also considered to allow for the formation of coalitions that can advocate more effectively for women-friendly policies (Kanter, 1997: pp.996).

This positive association between the descriptive and substantive representation of women has been uncovered for both women in the legislature and in cabinet (Beckwith, 2007; Reingold, 2008; Atchison and Down, 2009; Nwankwor, 2021; Curtin, 2008; Whitford et al., 2007). Works examining the cabinet rightly point to the importance of cabinet to the substantive representation of women, being a policymaking institution and an "institution of power" (Nwankwor, 2021: pp.241). As Atchison and Down articulate, the policymaking power of the cabinet means "we should expect women's representation in the cabinet to be of considerable importance, and possibly even more importance than women's representation in the legislature", regarding positive policy outcomes for women and girls (Atchison and Down, 2009: pp.4).

However, much of the existing literature on the substantive representation of women by women cabinet ministers neglects to consider whether democracy is important to this link. Much analysis of the descriptive-substantive link limits their research only to democracies (Curtin, 2008; Nwankwor, 2021; Atchison and Down, 2009; Whitford et al., 2007; Beckwith, 2007; Celis and Childs, 2008; Cowel-Meyers and Langebin, 2009; Wängnerud, 2009). This neglects the growth of women's descriptive representation in non-democracies, with several having levels of women's representation in cabinets higher than the global average (22.8%) including, as of 2022, Nicaragua (63%), Rwanda (48%), Mozambique (55%), Ethiopia (41%), and Angola (38%) (World Bank, 2022). This growth across both democracies and non-democracies is depicted in figure 1.

Figure 1 Proportion of female cabinet ministers over time, colour coded by election type



Source: Quality of Government Institute, 2024

There does exist a small body of literature examining the descriptive-substantive link in non-democracies regarding women legislators. These works have found a positive link between the descriptive representation of women in the legislatures of non-democracies and the substantive representation of women, albeit dependent on levels of electoral competition (Forman-Rabinovici and Sommer, 2019; Mechkova and Edgell, 2024). This research proposes to contribute to this body of literature by expanding examination of the descriptive-substantive link in non-democracies to include the effects of women cabinet ministers. Existing literature suggests that the ability of women legislators and ministers in non-democracies to substantively represent women might be explained by "genderwashing", whereby autocratic leaders promote women within government to improve their domestic and international image (Bjarnegård and Donno, 2023; Jun, 2024). However, as outlined by Mechkova and Edgell, these women nevertheless "have the potential to promote policies that address the specific interests of women", despite the undemocratic nature of their appointment (Mechkova and Edgell, 2024: pp.2470). Given this research seeks to examine the substantive representation of women in non-democracies, it will focus more so on *how* women cabinet ministers in non-democracies can use their positions to substantively represent women, rather than *why* they are appointed to cabinet in the first place. Extensive discussion of "genderwashing" therefore lies beyond the scope of this research,

but remains an important concept to be aware of when examining women's representation in non-democracies.

2.2 The importance of the level of electoral competition

Non-democracies are not homogenous, and range from states with no elections, to states with multi-party elections that are manipulated. Accordingly, this research will distinguish between states with no elections, single-party elections, and non-democratic multi-party elections. A growing body of work suggests the latter of these non-democracies, sometimes referred to as electoral autocracies, rely to some extent on popular legitimacy (Cassani, 2017; Tannenberg et al., 2020). As this cannot be found through democratic legitimacy, electoral autocrats may turn to performance-based legitimacy (delivering social goods and services) as they aim to emulate democratic procedures, unlike states with no or single-party elections (Cassani, 2017; Tannenberg et al., 2020). Thus, I expect women cabinet ministers to be better able to deliver improved policy outcomes for women and girls in electoral autocracies than in states with no or single-party elections.

2.3 Women cabinet ministers, non-democracies, and education policy

It has been suggested autocratic leaders are willing to advance certain policy areas that pose the least threat to the stability of their regime; one such policy area is education, as national curricula can be set by the government (Mechkova and Edgell, 2024: pp.2455; Chang and Wu, 2022). Therefore, this research focuses on the effects of women cabinet ministers on education policy as an area likely to be allowed advancement by autocratic leaders.

Education has also been selected as the policy area of focus for this research due to its association with women and femininity. Extensive literature has found that individuals typically associate education policy with feminine qualities, with women being considered better suited to tackling educational policy than men (Alexander and Andersen, 1993: pp.530; Huddy and Terkildsen, 1993: pp.132; Sanbonmatsu and Dolan, 2009: pp.485). There is also evidence to suggest that women overall prioritise education as a policy area more so than men (Shapiro and Mahajan, 1986). This is typically attributed to the socialisation of women into gender roles that dictate they be carers for children, and thus be concerned

with their education (Yildirim, 2021: pp.1243). This association between women and education has translated into women frequently being appointed cabinet positions that relate to education policy (Krook and O'Brien, 2012: pp.842; Kroeber, 2024: pp.626). This informs my focus on education policy as a policy area women are most likely to have the capacity to influence.

The quantitative element of this research will focus on three education indicators: education expenditure (as a proportion of GDP); the average years of education for 15-24-year-old women; and the adult female literacy rate. These have been chosen to cover the main categories of education indicators: expenditure, access to education, and learning outcomes (Carvalho and Evans, 2022). Enrolment and literacy rates are the most used ways to measure women's progress in education in relation to the latter two categories of indicator, with the two comprising the education component of the Human Development Indicator (Walby, 2005: pp.377; Carvalho and Evans, 2022).

2.4 Hypotheses

This research thus intends to contribute to existing literature on the descriptive-substantive link by examining whether it can exist regarding women cabinet ministers in non-democracies. From the existing literature and theory, I formulate three hypotheses:

H_1: Women's descriptive representation in cabinet will have a positive effect on education expenditure regardless of the level of electoral competition within the state.

H_{2a}: Women's descriptive representation in cabinet will have a positive effect on educational outcomes for women and girls regardless of level of electoral competition.

$H_{2b:}$ The positive effect outlined in H_{2a} will be smaller in states with lower levels of electoral competition.

3. Data and Methods

3.1 Quantitative methods

To test these hypotheses, I first estimate linear regressions to assess whether states with higher proportions of women in cabinet see higher expenditure on education, as a percentage of their GDP. This is to assess whether the descriptive representation of women in cabinet can lead to increased financing of a traditionally feminine policy area (for discussion of this, refer to pages 10-11). Then, an interaction effect between election type and proportion of female cabinet ministers is added to test whether this relationship differs between states with varying levels of electoral competition. Secondly, I estimate linear regressions testing whether higher proportions of women in cabinet are associated with two different indicators of positive educational outcomes for women: average years of education for 15-24-year-old women, and the adult female literacy rate. These were chosen to cover both access to education and learning outcomes, two important measures of improved education for women (Carvalho and Evans, 2022). Again, interaction effects are added to assess whether the effect of female cabinet ministers on these indicators differs between states with varying levels of electoral competition. Regression results are displayed in both a table and a coefficient plot, and any significant interaction effects discovered are demonstrated using a margins plot.

For all tables, model 1 represents a bivariate model between proportion of female cabinet ministers and the dependent variable and model 2 adds a set of controls. Model 3 includes the main independent variable female cabinet ministers and its interaction with election type, and model 4 adds controls to this. Robust standard errors were used for all models to account for issues of heteroskedasticity as for all models a residuals-vs-fitted plot showed the standard error of the residuals is not fixed. Country fixed-effects are included in all models as all country-specific variation cannot be accounted for. In all models, the main independent variable proportion of female cabinet ministers is lagged by one year to account for potential reverse causality and endogeneity. An alternative lag structure of five years was also used as a robustness check (see appendix tables 9-11). Further robustness checks to account for issues of autocorrelation were also conducted by including a lagged version of each dependent variable (see appendix tables 12-14). In these robustness checks I found similar results regarding two dependent variables (education expenditure and the average years of education for 15-24-year-old women), but

that my findings were not as robust regarding the adult female literacy rate. This will be discussed in more detail in the results chapter (see pages 25-27).

All data in this paper are taken from the Quality of Government Institute's QOG standard dataset 2024 (Teorrell et al., 2024). This dataset was chosen for its compiling of several publicly available datasets into comparative data, allowing for a large panel dataset. Results will be interpreted cautiously, as connections and associations rather than as distinctly causal effects, due to the observational nature of the data and the potential that this research has been unable to account for all confounders or possibilities for endogeneity. Details on all variables used in this research are provided below, and in table 5 in the appendix.

3.1.1 Dependent variables

Education Expenditure. Education expenditure is measured as a percentage of each states' GDP, and includes spending on education by local, regional, and central governments (World Bank, 2024). This data comes from official government statistics, which means it has some limitations, despite being the best available data. Limitations include the potential that states with less capacity to gather and report statistics may provide inaccurate data, and that official government statistics are prone to manipulation for strategic purposes, particularly by non-democratic states seeking to improve their international reputation (Carlitz and McLellan, 2021: pp.160). Therefore, this paper will interpret results tentatively, taking these issues into consideration.

Average years of education (15-24-year-old women). This variable is measured as the average years spent in education by 15-24-year-old women within a state (IHME, 2015). This ranges from 0.48 years or just under six months (Afghanistan in 1970), to 16.6 or just over sixteen and a half years (Andorra in 2015). This variable is an estimate (IHME, 2015), and therefore we cannot be certain it is accurate. Results will therefore be interpreted cautiously.

Adult female literacy rate. The percentage of the female population over the age of 15 who can read, write, and are proficient in numeracy (World Bank, 2024). As with education expenditure, this variable

is derived from official government statistics and therefore faces similar limitations. Again, results will be interpreted cautiously to account for this.

3.1.2 Independent variables

Proportion of Female Cabinet Ministers. This variable was created from two variables within the QOG dataset, number of female cabinet ministers and number of cabinet ministers (Nyrup and Bramwell, 2020). Number of female cabinet ministers was divided by number of cabinet ministers to do this. This ranges from zero (several states across many years, recently including but not limited to: Azerbaijan, Iran, and China) to 0.6 (Rwanda in 2021). To mitigate potential reverse causality and endogeneity between this and all dependent variables, in all models this variable has been lagged by one year. To act as a robustness check, an alternative lag structure of five years can be found in tables 9-11 in the appendix.

Election Type. Election type is a four-part categorical variable, with categories denoting differing levels of electoral competition (Bjørnskov and Rode, 2020). This was chosen rather than a dichotomous democracy measure to account for variation between different types of autocracies, given the potential importance of electoral competition (see page 10). I expect level of electoral competition to affect education expenditure and outcomes, as even some form of competition can incentivise policymakers to ensure policies have positive effects on the electorate, and election periods allow opportunities for women policymakers to introduce new policy (Mechkova and Edgell, 2024: pp.2472). The categories, in order of increasing electoral competition are: no elections, single-party elections, non-democratic multi-party elections, and democratic elections, with democratic elections being the modal category.

3.1.3 Controls

The following three controls were added to models 2 and 4 for all three dependent variables.

Gross Domestic Product per Capita. This variable is measured in current US dollars, ranging from $12.79 (Myanmar in 1966) to $234,317.10 (Monaco in 2021) (World Bank, 2024). I have taken the natural logarithm of this variable to account for its right-skewed distribution. The logged version ranges from 2.55 (Myanmar in 1966) to 12.4 (Monaco in 2021). GDP per capita has been controlled for as

wealthier countries are likely to spend more on education and have better educational outcomes, including levels of enrolment and literacy rates (Mechkova and Edgell, 2024: pp.2464). GDP per capita also has the potential to affect the proportion of female cabinet ministers, as wealthier countries may see their politics less dominated by concerns of economic development, allowing for other considerations such as gender parity in politics (Kenworthy and Malami, 1999: pp.241).

Communist/Socialist State. This is a dichotomous variable depicting whether a state is communist or socialist or is neither (Bjørnskov and Rode, 2020). This was controlled for to account for government ideology, as left-wing governments typically prioritise public spending (Potrafke, 2018: pp.145; Pickering and Rockey, 2011: pp.907). Communist/socialist ideology may also affect the proportion of female cabinet ministers given its focus on eliminating social injustices and early socialist states' adoption of legislation allowing women to run for political office (Lóránd, 2022: pp.368-369). Similarly, this left-wing ideological focus on eliminating social injustice can be reasonably presumed to have a positive impact on women's enrolment in education. It is worth noting, however, the historical tensions between socialism and feminism, with early socialist thinkers sceptical of a separate movement for the emancipation of women (Lóránd, 2022: pp.364). Nevertheless, this variable is added as it is the best available measure of government ideology.

Population Growth. This variable is expressed as a percentage, representing the rate of growth from midyear t to midyear t-1 (World Bank, 2024). This was controlled for as several studies have found this to have a positive influence on education expenditure, as a higher rate of population growth leads to more children entering the education system, which therefore requires more funding (Busemeyer, in Yun and Yusoff, 2019: pp.135; Tilak, 1989: pp.129; Kurban et al., 2015: pp.103).

The following controls were added only to models for some dependent variables.

Inflation. This was added as a control in the models for education expenditure. Inflation (World Bank, 2024) was controlled for as several studies have found this to have a negative effect on education expenditure due to rising average prices (Tilak, 1989: pp.129; Sagarik, 2013; Fonchamnyo and Sama, 2016).

Proportion of female primary school teachers. This was added as a control only in the models for average years of education for 15-24-year-old women and adult female literacy rate. The proportion of primary school teachers that are women is controlled for as they have been found to act as a role model for girls in school, contributing to higher test results and longer stays in education (Joshi et al, 2022; Haugen et al, 2014). Given higher female literacy rates and years in education may feasibly themselves lead to increased numbers of female teachers, this control has been lagged by 1 year in all models.

Controlling for Human Development Index (HDI) was also considered, expecting a higher HDI to lead to higher levels of women's representation as it indicates higher levels of education among women. It was omitted due to multi-collinearity with GDP per capita. GDP per capita was chosen in preference of HDI due to concerns for reverse causality – higher levels of women's representation and enrolment in education are likely to lead to a higher HDI score due to the gender development index measuring women's expected years of education and estimated income (UNDP, no date b), as well as vice versa. Furthermore, higher education expenditure has been shown to increase HDI score (Lantion et al., 2023: pp.13). For these reasons, HDI is not included as a control in this research.

3.2 Case studies

This research will then turn to a qualitative approach to supplement the quantitative element, using case studies to provide a detailed, "thick" (Vromen, 2010: pp.249) analysis of how women cabinet ministers in non-democracies have substantively represented women. This will add depth to the research to complement any broad and generalisable associations uncovered in the quantitative section. To identify clear links between women's representation in cabinet and improved educational outcomes for women in non-democracies, I have chosen to focus exclusively on education ministers from such states, namely Janet Kataaha Museveni, Aïcha Bah Diallo, and Graça Machel. These three cases cover a current minister (Museveni) and past ministers (Bah Diallo and Machel), recognising that exploration of current ministers and assessing the outcomes of their actions and policies will be limited due to their ongoing nature – case studies of past education ministers aim to help address this issue. This method does, however, have its limitations. Firstly, all three case studies come from Africa. Despite the diversity of the continent, there exist several continent-wide groups and initiatives (for example, the African Union)

the ministers studied engage with. Thus, this research lacks truly worldwide scope. However, as qualitative methods broadly lack generalisability (Vromen, 2010: pp.255), the aim of these case studies is to provide detailed accounts of how these *specific* ministers have substantively represented women, rather than to provide a generalisable account of how women ministers in non-democracies overall can substantively represent women. This research will therefore not draw generalisable conclusions from the case studies.

Thus, the two methods used in this research complement each other to allow for both generalisable findings through associations discovered via quantitative methods, and detailed individual accounts of the descriptive-substantive link through case studies. This research will begin by using quantitative methods to establish general associations between the descriptive and substantive representation of women across regime types, and will then turn to qualitative case studies to gain insights into *how* certain ministers in non-democracies have been able to substantively represent women. The following section outlines the findings of the quantitative portion of this research.

4. Quantitative Findings

4.1 Women's descriptive representation in cabinet and education expenditure

Firstly, table 1 and figure 2 depict the correlation between women's descriptive representation in cabinet and education expenditure. Models 1 and 2 demonstrate the positive association between the proportion of women in cabinet and expenditure on education, both with and without controls. When adding controls outlined on pages 14-16, a 1 percentage point increase in the proportion of female cabinet ministers is associated with a 1.2 percentage point increase in education expenditure as a proportion of GDP, statistically significant at the 1% level. Models 3 and 4 depict a similar association, regardless of level of electoral competition or its interaction with the proportion of female cabinet ministers. While these models show that states with no elections overall spend less of their GDP on education than democracies, there remains a positive association between female cabinet ministers and education expenditure. With none of the interaction effects being statistically significant, we can assume that this positive association is not dependent on and does not vary by level of electoral competition. Thus, model

4 finds that, regardless of level of electoral competition, a 1 percentage point increase in women's descriptive representation in cabinet is associated with a 1.3 percentage point increase in education expenditure as a proportion of GDP, statistically significant at the 1% level. Given the standard deviation of education expenditure is 1.95 (see table 5 in appendix), the size of this effect is quite large. Overall, table 1 demonstrates the positive association between the level of women's descriptive representation in cabinet and education expenditure is both substantively and statistically significant, even when controlling for potential confounding variables, and does not differ between states with differing levels of electoral competition. This supports the first of my two hypotheses (see page 11), that women's descriptive representation in cabinet will have a positive effect on education expenditure regardless of the level of electoral competition within the state.

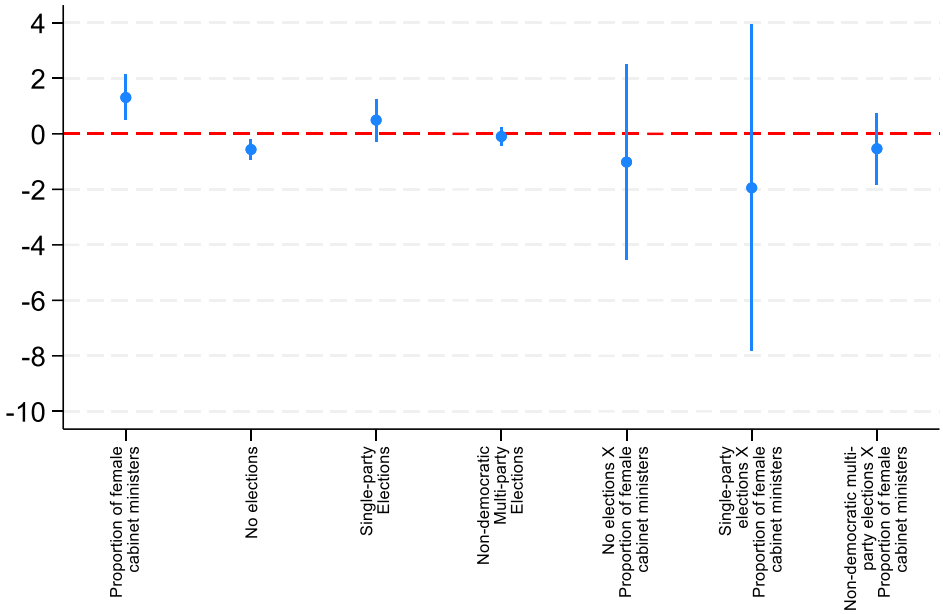
Table 1 Average marginal effects of women's descriptive representation in cabinet on education expenditure (%GDP)

	Model 1	Model 2 [A]	Model 3	Model 4[A]
Proportion of female cabinet ministers (1 year lag)	1.8***	1.2***	2.0***	1.3***
	(.40)	(.37)	(.43)	(.42)
Election type [B]				
No elections			-.60***	-.56***
			(.19)	(.19)
Single-party elections			.52	.49
			(.32)	(.39)
Non-democratic multi-party elections			-.03	-.09
			(.18)	(.17)
Proportion of female cabinet ministers x election type [B]				
Female cabinet ministers x no elections			-.34	-1.0
			(1.9)	(1.8)
Female cabinet ministers x single-party elections			1.6	-1.9
			(3.50)	(3.0)
Female cabinet ministers x non-democratic multi-party elections			-1.2	-.53
			(.74)	(.65)
Intercept	4.1***	2.8***	4.1***	2.9***
	(.06)	(.51)	(.08)	(.50)
Observations	4375	4059	4375	4059
Countries	168	163	168	163
R-squared	.06	.13	.08	.14

[A] Models 2 and 4 include controls GDP per capita, communist/socialist state, population growth, and inflation. See table 6 in appendix. [B] Reference category is democratic elections

Note: 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Source: Quality of Government Institute, 2024

Figure 2 Average marginal effects of women's descriptive representation in cabinet on education expenditure (%GDP)



Note: estimations taken from table 1 model 4. Source: Quality of Government Institute, 2024

4.2 Women's descriptive representation in cabinet and average years of education for 15-24-year-old women

Table 2 and figure 3 turn to the correlation between women's descriptive representation in cabinet and the average years 15-24-year-old women spend in education. Models 1 and 2 demonstrate a positive association between the two both with and without controls, statistically significant at the 1% level. Model 2 finds that a 1 percentage point increase in women's representation in cabinet is associated with a 3.76-year increase in the average years of education for 15-24-year-old women, when controlling for potential confounding variables (see pages 14-16). Models 3 and 4 depict a similar positive association when controlling for level of electoral competition and its interaction with the proportion of female cabinet ministers, again statistically significant at the 1% level. These models do find, however, that there is a statistically significant difference in the average years of education for 15-24-year-old women between democracies, states with no elections, and states with single-party elections. The latter two both see lower average years spent in education than democracies, by roughly half a year. However, given no statistically significant interaction effects were found, there is no evidence that the positive association between women's descriptive representation in cabinet and average years of education for

young women differs between states with differing levels of electoral competition. Thus, model 4 finds that, regardless of level of electoral competition, a 1 percentage point increase in the proportion of women in cabinet is associated with a 3.46-year increase in the average years of education for 15-24-year-old women. Given the standard deviation of average years of education for 15-24-year-old women is 3.54 years (see table 5 in appendix), this 3.64-year increase is quite large, meaning this association holds substantive as well as statistical significance. Thus, the effect of women's descriptive representation in cabinet on the average years of education of 15-24-year-old women is both statistically significant and sizeable, regardless of level of electoral competition. Although some non-democracies may have lower years of education for 15-24-year-old women, increasing proportions of female cabinet ministers has the same positive effect on this education indicator as it does in democracies.

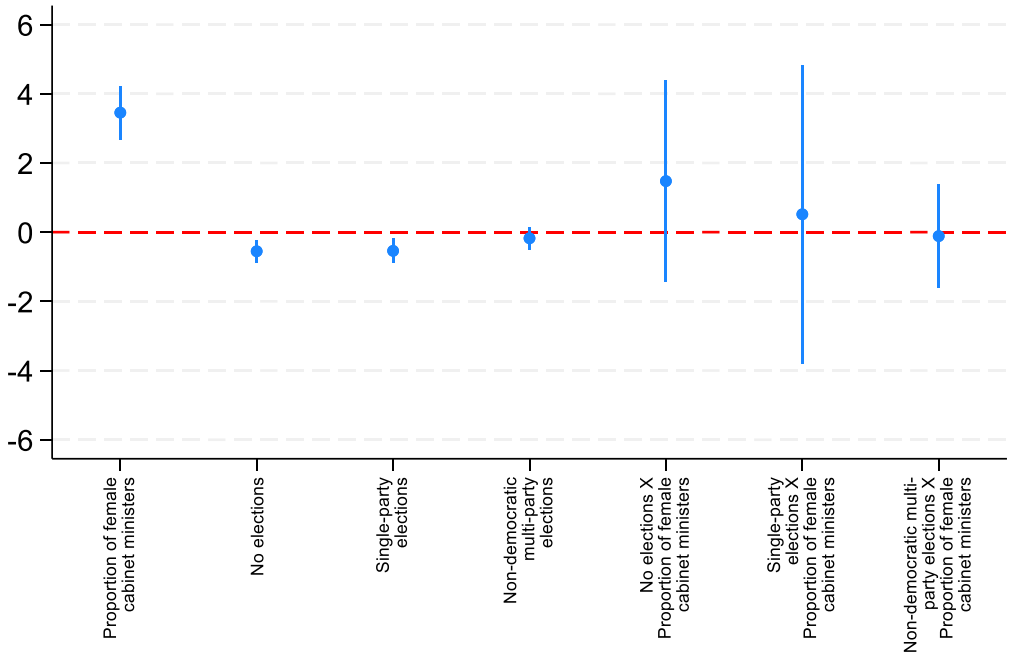
Table 2 Average marginal effects of women's descriptive representation in cabinet on average years of education (15-24-year-old women)

	Model 1	Model 2 [A]	Model 3	Model 4[A]
Proportion of female cabinet ministers (1-year lag)	12***	3.8***	10***	3.5***
	(.49)	(.39)	(.44)	(.39)
Election type [B]				
No elections			-1.7***	-.55**
			(.20)	(.17)
Single-party elections			-1.6***	-.54**
			(.23)	(.18)
Non-democratic multi-party elections			-.96***	-.18
			(.23)	(.17)
Proportion of female cabinet ministers x election type [B]				
Female cabinet ministers x no elections			.98	1.5
			(3.0)	(1.5)
Female cabinet ministers x single-party elections			-3.1	5.2
			(3.4)	(2.2)
Female cabinet ministers x non-democratic multi-party elections			1.2	-.11
			(1.0)	(.08)
Intercept	6.2***	-5.0***	7.0***	-4.6***
	(.04)	(.59)	(.10)	(.89)
Observations	7029	3847	7029	3847
Countries	176	166	176	166
R-squared	.13	.80	.25	.80

[A] Models 2 and 4 include controls GDP per capita, communist/socialist state, population growth, and proportion of female primary teachers. See table 7 in appendix. [B] Reference category is democratic elections

Note: models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Source: Quality of Government Institute, 2024

Figure 3 Average marginal effects of women's descriptive representation in cabinet on average years of education (15-24-year-old women)



Note: estimations taken from table 2 model 4. Source: Quality of Government Institute, 2024

4.3 Women's descriptive representation in cabinet and the adult female literacy rate

Finally, table 3 and figure 4 depict the association between women's descriptive representation in cabinet and the adult female literacy rate. Models 1 and 2 find a positive association between the two, albeit much smaller once controlling for potential confounding variables (see pages 14-16). This association is statistically significant at the 5% level. Models 3 and 4 find a similar positive association between women's descriptive representation in cabinet and the adult female literacy rate regardless of level of electoral competition and other controls. Model 4 finds a 1 percentage point increase in women's descriptive representation in cabinet is associated with a 7.11 percentage point increase in the adult female literacy rate, statistically significant at the 5% level. However, given the standard deviation of the adult female literacy rate is 25.2 (see table 5 in appendix), this effect is quite small.

Finally, these models find there is a statistically significant interaction between the proportion of female cabinet ministers and whether a state has no elections. Thus, in such states, the association between the proportion of female cabinet ministers and the adult female literacy rate is different to that in

democracies. This is depicted in table 4 and figure 5, which show that the potential effect of increasing proportions of female cabinet ministers on the adult female literacy rates in states with no elections is larger than in democracies. For example, a 15-percentage point increase in women in cabinet, from 10% to 25%, corresponds with a 1.1 percentage point increase in the adult female literacy rate in democracies, but a 6-percentage point increase in states with no elections. Thus, while in states with single-party and non-democratic multi-party elections the positive link between women's descriptive representation and the adult female literacy rate is similar in size to that of democracies, in states with no elections the link is in the same direction as in democracies, but of a greater size. Thus, it is implied the increasing representation of women in cabinet in states with no elections has a greater positive association with the adult female literacy rate than it does in democracies. Nevertheless, given the standard deviation of the adult female literacy rate is 25.5, these increases in adult female literacy rate and the differences between states with varying levels of electoral competition are quite small, despite their statistical significance.

The findings from tables 3 and 4 support hypothesis $H2_a$: that increased levels of women's descriptive representation in cabinet would be associated with improved educational outcomes for women and girls. However, the findings from tables 3 and 4 do not support hypothesis $H2_b$: that women's descriptive representation will have a positive effect on educational outcomes for women and girls across regime types, but this effect will be smaller in states with lower levels of electoral competition. Largely, the findings of this section indicate no difference in the association between women's descriptive representation in cabinet and indicators of improved educational outcomes for women between states with varying levels of electoral competition. Particularly examining the effect of women's descriptive representation in cabinet on average years of education for 15-24-year-old women, it is evident that regardless of level of electoral competition, an increase in women's descriptive representation is associated with a statistically significant and relatively large positive association with women's years spent in education. The only difference found was between states with the lowest level of electoral competition and democracies regarding the adult female literacy rate. However, in opposition to hypothesis $H2_b$, it was found that in states with no elections, the size of the potential effect of women's

descriptive representation on women's education outcomes is greater, not smaller, than in democracies. It is worth noting, however, that the size of the potential effect of women's descriptive representation on the adult female literacy rate is quite small, regardless of these differences between states with no elections and with democratic elections.

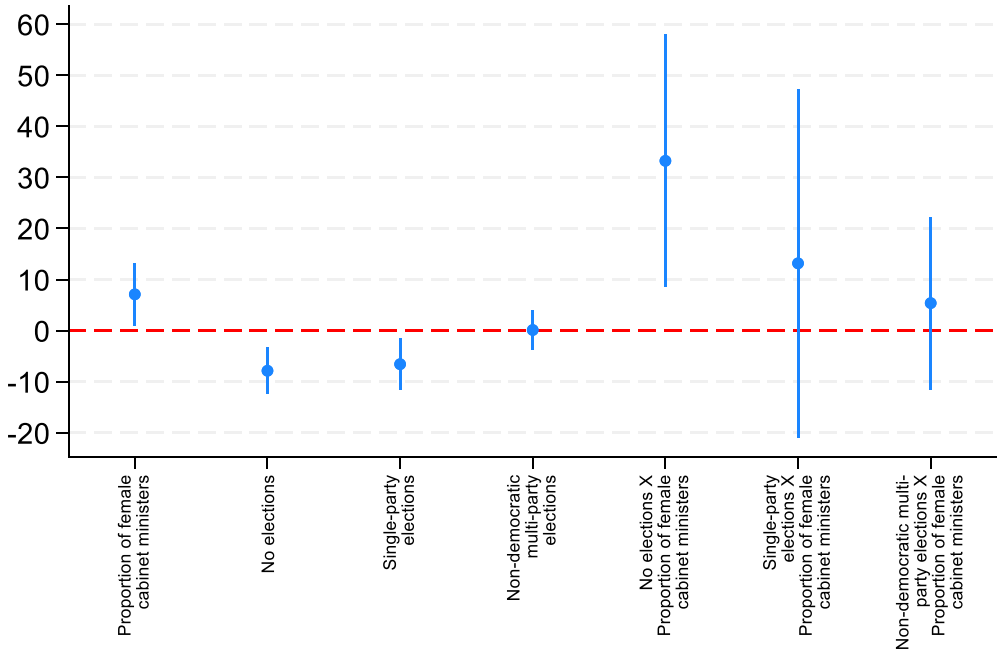
Table 3 Average marginal effects of women's descriptive representation in cabinet on the adult female literacy rate

	Model 1	Model 2 [A]	Model 3	Model 4[A]
Proportion of female cabinet ministers (1-year lag)	42***	14**	22***	7.1**
	(4.8)	(4.3)	(3.9)	(3.1)
Election type [B]				
No elections			-15***	-7.9**
			(2.4)	(2.3)
Single-party elections			-12**	-6.6**
			(4.8)	(2.6)
Non-democratic multi-party elections			-4.4	.12
			(3.0)	(2.0)
Proportion of female cabinet ministers x election type [B]				
Female cabinet ministers x no elections			80***	33**
			(12)	(13)
Female cabinet ministers x single-party elections			16	13
			(30)	(17)
Female cabinet ministers x non-democratic multi-party elections			33**	5.4
			(10.)	(8.5)
Intercept	69***	-1.5	74***	2.4
	(.66)	(5.5)	(1.3)	(6.5)
Observations	892	626	892	626
Countries	148	135	148	135
R-squared	.03	.79	.03	.79

[A] Models 2 and 4 include controls GDP per capita, communist/socialist state, population growth, and proportion of female primary teachers. See table 8 in appendix. [B] Reference category is democratic elections

Note: 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Source: Quality of Government Institute, 2024

Figure 4 Average marginal effects of women's descriptive representation in cabinet on the adult female literacy rate



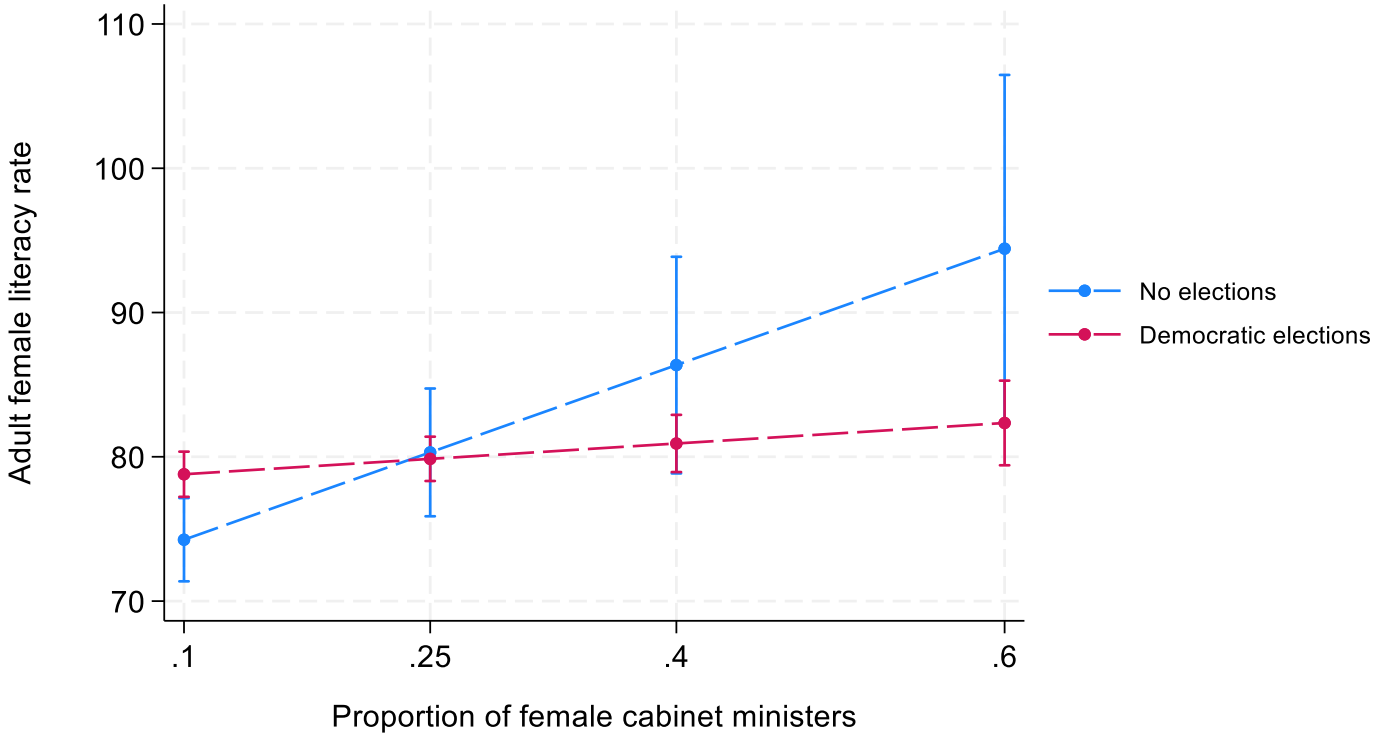
Note: estimations taken from table 3 model 4. Source: Quality of Government Institute, 2024

Table 4 Predictive margins with 95% confidence intervals

Proportion of female cabinet ministers	Adult female literacy rate	95% confidence interval
10%		
No elections	70.3***	[67.5, 73.1]
Single-party elections	69.6	[65.6, 73.6]
Non-democratic multi-party elections	75.5	[73.7, 77.2]
Democratic elections	74.8***	[73.3, 76.4]
25%		
No elections	76.3***	[71.8, 80.9]
Single-party elections	72.6	[65.0, 80.3]
Non-democratic multi-party elections	77.4	[74.6, 80.2]
Democratic elections	75.9***	[74.3, 77.5]
50%		
No elections	86.4***	[76.5, 96.4]
Single-party elections	77.7	[62.1, 93.3]
Non-democratic multi-party elections	80.5	[74.0, 86.9]
Democratic elections	77.7***	[75.5, 80.1]

Note: *** marks statistically significant interaction effects found in table 3 model 4.

Figure 5 Predictive margins with 95% confidence intervals



Note: Based on predictions from table 4. Source: Quality of Government Institute, 2024

4.4 Robustness checks

For education expenditure and the average years of education of 15-24-year-old women, robustness checks of an alternative lag structure (5-year lag) and accounting for autocorrelation (1-year lag on dependent variables), found similar results (see tables 9-14 in appendix). For both, an increase in women's representation in cabinet was associated with higher education expenditure and a more years in education, regardless of the level of electoral competition. While these robustness checks did find that states with no elections and single-party states had statistically significantly lower years of education for 15-24-year-old women than democracies, there was no evidence to suggest the positive association between women's descriptive representation and years of education differed between regime types. Instead, this demonstrates that although non-democracies may overall have lower levels of education for young women, there is a similar positive effect of women's descriptive representation across all regime types.

However, robustness checks did cast doubt on my findings regarding the adult female literacy rate. Alternative lag structures and autocorrelation checks found, when adding controls, the effect of

women's descriptive representation in cabinet on the adult female literacy rate was no longer statistically significant. Thus, the findings outlined in section 4.3 must be taken tentatively, although given the small size of any potential effects found in section 4.3, it is evident that the descriptive representation of women in cabinet has insignificant effect on increasing the adult female literacy rate.

To summarise in relation to my hypotheses, this quantitative analysis has found support for hypotheses H1 and $H2_a$. A positive association between the level of women's descriptive representation in cabinet and education expenditure has been found to be both statistically significant, and sizable in its potential effect, regardless of level of electoral competition, supporting hypothesis H_1. A positive association was also found regarding women's descriptive representation and the average years of education for 15-24-year-old women, supporting hypothesis $H2_a$. There was no difference found in the positive potential effect of women's descriptive representation on the average years of education for 15-24-year-old women across states with varying levels of electoral competition. However, there was a difference found in the potential effect of women's descriptive representation on the adult female literacy rate between states with no elections and states with democratic elections – the potential effect in states with no elections being larger than the effect in states with democratic elections. This runs contrary to hypothesis $H2_b$, which hypothesised effects to be smaller in states with lower levels of electoral competition. However, as robustness checks (see tables 11 and 14 appendix) cast doubt on findings regarding the adult female literacy rate, little can be concluded from this, and it is instead unclear as to the effect of women's descriptive representation on this educational outcome. Thus, there is no conclusive evidence to support or reject hypothesis $H2_b$ regarding the adult female literacy rate.

These findings overall suggest there exists a link between the descriptive representation of women in cabinet and the substantive representation of women's educational interests, when measured as education expenditure and access to education, regardless of the level of electoral competition in the state. However, there is insufficient evidence to suggest a similar association regarding an indicator of girls' learning outcomes, the adult female literacy rate. While this section has established these general associations and links, these findings do not represent causal relationships. This study will therefore now turn to case studies to uncover detail on some of the ways in which women cabinet ministers can

and have substantively represented women. This will add depth to the broad associations revealed through this quantitative analysis.

5. Case Studies

Having established the general associations between the descriptive representation of women in cabinet and improved educational outcomes for women and girls in the previous section, this dissertation will now turn to case studies of three women ministers of education in non-democracies to discover *how* they have been able to substantively represent women. This will begin with Janet Kataaha Museveni, the current Minister of Education and Sports of Uganda to depict the recent and ongoing link between descriptive and substantive representation. Recognising that the recency and ongoing nature of this case study will make it difficult to discern detailed outcomes of her policies, this section will then turn to two women education ministers from the past. These will be Aïcha Bah Diallo, former education minister of Guinea, and Graça Machel, former education minister of Mozambique. Both Bah Diallo and Machel are widely-known for their more recent international activism regarding girls' education, but study of their time as education ministers is underdeveloped (Action Education, 2019; Sheldon, 2021). These case studies will demonstrate the importance of their time in cabinet both to girls' education during their tenure, and to their more recent international activism. Overall, these three case studies will provide insight into how women cabinet ministers in non-democracies have been able to utilise their position in cabinet to advance the educational interests of women and girls, both in recent years and in the past.

5.1 Janet Kataaha Museveni

Janet Kataaha Museveni has been Minister of Education and Sports for Uganda since June 2016 and is also the First Lady of Uganda (Ministry of Education and Sports, no date). Uganda is considered by the Freedom House to be "not free", with the state's multi-party elections deemed to be lacking credibility (Freedom House, 2025). The ruling National Resistance Movement (NRM) has been in power since 1986, under the leadership of President Yoweri Museveni, husband of Janet Kataaha Museveni (to avoid confusion, Janet Museveni will be referred to by her full name throughout this case study) (Freedom

House, 2025). The NRM maintains power through patronage, prosecution of opposition, and intimidation, with media and academic freedom curtailed (Freedom House, 2025). Janet Museveni's appointment as minister was one of several familial appointments made by President Museveni (Bareebe and Titeca, 2013: pp.98), and is indicative of the pervasiveness of patronage and lack of democracy in political appointments in Uganda.

Although the focus of this case study is on Janet Museveni's career as Minister of Education and Sports, it is important to recognise that prior to her appointment she had already wielded her position as First Lady to improve the lives of women and girls. This includes establishing the Uganda Women's Effort to Save Orphans (UWESCO) and the National Strategy for the Advancement of Rural Women (van Wyk et al., 2018: pp.8). Thus, it is evident that Janet Museveni was skilled in using her position to substantively represent women before she entered cabinet. The remainder of this case study will uncover how she has also used her position as Minister of Education and Sports to improve the lives and education of Ugandan women and girls.

Firstly, this case study will examine campaigns and initiatives implemented by Janet Museveni. She has led and implemented the campaign "Protect the Girl, Save the Nation", designed to address issues of child marriage and teen pregnancy in Uganda that frequently led to young girls missing or dropping out of education, particularly in the wake of school closures during the COVID-19 pandemic (Ntabadde, 2021). Janet Museveni used the launch of this campaign to commit herself and her office to tackling the issues of child marriages and teen pregnancies, calling the issue "alarming" and claiming it "deserves [their] attention" (Kiapi: 2022). The campaign received widespread support, internationally through funding from the Netherlands and Austria and an assertion of joint commitment to tackling these issues from the Ambassador of Ireland to Uganda, as well as domestically from religious leaders including the Most Rev. Dr. Steven Samuel Kazimba Mugalu (Kiapi, 2022). This international and domestic recognition is evidence of Janet Museveni's power and status as education minister, and her success in utilising it to mobilise support for issues facing girls and their education.

It is also worth noting the inter-ministerial nature of the campaign, with Janet Museveni's personal commitment matched by other prominent women politicians, namely the Vice President H.E Hon.

Jessica Apulo and the Prime Minister Rt. Hon. Robinah Nabbanja (Kiapi, 2022). This led to the campaign involving several Ministries, Departments, and Agencies collectively taking a multisectoral approach to tackling the issues of child marriage and teen pregnancy that keep young girls out of education (Ntabadde, 2021). This demonstrates the importance of elevated levels of descriptive representation of women in cabinet: women across various departments and ministries can combine their influence, even in non-democratic systems such as Uganda, to bring attention to issues facing women and girls.

Another campaign led by Janet Museveni was her launch of the African Union's "Africa Educates Her" campaign in Uganda (African Union, 2023). Speaking on behalf of Janet Museveni, Minister of State for Sports, H.E. Peter Ogwang stated that this "represents [their] commitment to empowering and educating our girls" (African Union, 2023). Being an initiative led by the African Union, its implementation in Uganda is internationally monitored, thus demonstrating a strong commitment by the Ugandan Ministry of Education and Sports, and the wider government, to increase enrolment and completion rates and reduce grade repetition for girls in education (African Union, 2023).

To turn to specific policies implemented by the Ministry of Education and Sports, Janet Museveni writes for the Independent newspaper outlining her and the NRM's successes in improving girls' education. She refers to affirmative action policies of the 1990s that increased women's enrolment in Ugandan universities, and outlines that the success of these policies has continued into her tenure as Minister of Education and Sports, with 51 Ugandan universities enrolling more women than men in 2021 (Museveni, 2022). Janet Museveni also outlines her success in revising "archaic guidelines" which meant pregnant girls were expelled from school – now, they are granted maternity leave and encouraged to return to education, with school administrators required to maintain contact with these girls to ensure their wellbeing (Museveni, 2022). The successful implementation of these policies demonstrates Janet Museveni's ability to use her position as head of the Ministry of Education and Sports to improve girls' education. Again, Janet Museveni uses this opportunity as Minister of Education and Sports to reiterate her commitment to achieving better education for Ugandan women, closing the article by stating "we will not abandon them now" (Museveni, 2022).

Evident throughout this analysis of Janet Museveni's role as Minister of Education and Sport is how she uses her position of power to consistently bring attention to issues affecting the education of women and girls. While the campaigns such as "Protect the Girl, Save the Nation" and "Africa Educates Her" are too recent to discern their impact, there has been improvement in the rates of young mothers returning to education, albeit slow given the time needed to change social norms (Haarløv, 2024). Regardless, Janet Museveni's consistent reiteration of issues relating to girls' education is indicative of her personal commitment to advancing girls' education. The successful implementation of new guidelines regarding teen mothers and campaigns "Protect the Girl, Save the Nation" and "Africa Educates Her" indicate that she has been able to wield her power as a cabinet minister to turn her personal commitment into nationwide policy commitment.

5.2 Aïcha Bah Diallo

To explore a historical case in which the impact of a woman cabinet minister can be more clearly discerned, this section will now turn to an analysis of Aïcha Bah Diallo's time as Minister of Education for Guinea from 1989 to 1996. While now considered a democracy, as of 1995 Freedom House declared Guinea "not free", following manipulated and violent elections in 1993 and more open, but still heavily influenced by the government, elections in 1995 (Freedom House, 1996: pp.249-250). Thus, Bah Diallo's tenure as Minister of Education was during a period in which Guinea held non-democratic multi-party elections under the rule of coup leader Lansana Conté, who appointed Bah Diallo to cabinet.

Despite the undemocratic nature of Guinea at the time, Bah Diallo is widely heralded as a "champion" of girls' education (Trust Africa, 2025; Mo Ibrahim Foundation, 2025). During her tenure as Minister of Education, Bah Diallo worked to remove obstacles to education for girls, focusing on poverty and how long distances between home and school created concerns for girls' safety (Mo Ibrahim Foundation, 2025). Initiatives driven by Bah Diallo led to a doubling of the enrolment of girls in primary education, from 113,000 to 233,000, and an increase in overall enrolment from 29% to 60% (Trust Africa, 2025; Action Education 2019; FAWE, 2024). She outlined her own personal connection to issues of girl's education in an interview for the New African's article 100 Most Influential Africans: she recalls when her close friend was expelled from school when she fell pregnant, and how this inspired

her to change policy so as to forbid this practice once she became Minister of Education (New African, 2013). She further outlines the resistance she faced from her ministry when trying to implement this policy, and how she spent two years convincing relevant parties that girls should be allowed to return to school after they have given birth (New African, 2013). This is indicative of the particular importance of Bah Diallo as Minister in changing this policy. Since she left office, Guinea has been cited as an example of the positive impact of allowing teen mothers to return to education, illustrating the success of Bah Diallo's efforts (Eremu, 2003).

Bah Diallo was also able to utilise her position in the Guinean cabinet to become a founding member of the Forum for African Women Educationalists (FAWE) in 1992, which sought to bring together women political leaders from across Africa to work toward equal educational opportunities for girls (FAWE, 2024). FAWE itself notes that it was Bah Diallo's record in improving girls' access to education as Guinean Minister of Education that led her to gain continent-wide respect within the Forum (FAWE, 2024). This is testament to her capacity to substantively represent the interests of women and girls during her tenure as Minister of Education, with her successes domestically allowing her to lead an international initiative to substantively represent the educational interests of women and girls across the continent.

As recognised by FAWE, Bah Diallo's international efforts to improve girls' education both during and after her tenure as Minister of Education were made possible by the international respect her actions as Minister afforded her (FAWE, 2024). Bah Diallo herself speaks of the continuity between her time as Minister of Education and her roles with UNESCO, stating that she has "always remained straight and true to [her] values" throughout both (Bah Diallo, quoted in Action Education, 2019). Thus, Bah Diallo's time in cabinet and the respect and power it conferred upon her has allowed her to continue engaging in the substantive representation of women's educational interests at the international level. This includes continuing her efforts to see an end to the expulsion of teen mothers from schools across Africa following her success as Minister in Guinea, something she "swore" when she was appointed minister "would no longer exist" (Bah Diallo, quoted in Action Education, 2019). Since its creation headed by Bah Diallo, FAWE has continued to advocate for teen mothers and their education, launching

programmes to support return to education alongside running small businesses to meet financial needs, as well as programmes for entry to tertiary education and technical education (Omondi-Adeitan, 2022). This demonstrates how Bah Diallo has utilised the respect and power conferred onto her as Minister of Education to both create FAWE and to continue advocating for the education of teen mothers both during and after her time in office.

5.3 Graça Machel

While Graça Machel may be best known as the former First Lady of both Mozambique and South Africa, she is also a champion of women's education stemming from her time as the first Minister for Education in the newly independent People's Republic of Mozambique, from 1975 to 1989 (Sheldon, 2021). During this time, Mozambique was a one-party state ruled by democratic socialist party Frente de Libertação de Moçambique (FRELIMO), led by President Samora Machel, husband of Graça Machel (Freedom House, 2024). To avoid confusion with Samora Machel, Graça Machel will be referred to by her full name throughout this case study. It is worth noting that it was likely her marriage to Samora Machel that cemented her inclusion in cabinet, being one of the only women in Mozambique to reach such political heights (Mayer, 2023: pp.125). Nevertheless, Graça Machel was able to use this position to advance the education of Mozambican girls, and it was her time in this position that inspired her later activism in girls' education across Africa (Baker, 2023).

Education in post-independence Mozambique was designed to support the liberation effort, and, in Graça Machel's own words, "to destroy the former social relationships" that existed during Mozambique's time as a Portuguese colony (Machel, quoted in Barnes, 1982: pp. 409). Whilst this did not explicitly include goals of gender equality, the Ministry of Education led by Graça Machel encouraged more girls into leadership roles within schools, with class meetings encouraged to discuss how to support the active inclusion of women in society (Barnes, 1982, pp.416). When asked about her time in Mozambique's first government, Graça Machel herself states that eradicating illiteracy and promoting girls' education were causes she "gave [her] youthful years to" (Machel, quoted in Girls Not Brides, 2011). During her time as Minister for Education, Graça Machel promoted FRELIMO's goal of universal education, and as she left office school enrolment had nearly doubled, with most young boys

and around 75% of young girls enrolled in school. Graça Machel's tenure also saw a 72% reduction in the illiteracy rate (Mayer, 2023: pp.127).

Similarly to Aïcha Bah Diallo, Graça Machel's activism for girls' education after she left office was largely inspired by her time as Minister for Education – the gap between the proportions of boys and girls enrolled in school when she left office set Graça Machel on a trajectory to campaign for girls' education across the continent (Baker, 2023). Notably, Graça Machel speaks of her concern for child brides, and how this has been a concern of hers ever since she began as Minister for Education, when she noticed that at age seven, most girls where in school, but by age ten most had dropped out – this was due to child marriage (Machel, quoted in Girls Not Brides, 2011). This concern later led her to launch Girls Not Brides, a global network aiming to end child marriage (Girls Not Brides, 2011). Girls Not Brides has been influential in UN resolutions regarding child marriage, with its recommendations influencing the UN General Assembly's 2024 Resolution of Child, Early and Forced Marriage to include recognition of informal unions (Girls Not Brides, 2025). Graça Machel has also founded the Graça Machel Trust which advocates for women's economic empowerment (Graça Machel Trust, 2021). The Graça Machel Trust's efforts have attracted grants from the Visa Foundation to aid the growth of gender inclusive small businesses, demonstrating the Trust's success (Graça Machel Trust, 2023).

Graça Machel was able to become a leading activist for women's rights and education within Africa by leveraging her position in the first Mozambican cabinet; by having an institutionalised position of power, she was able to establish herself internationally as an effective agent for change (Mayer, 2023: pp.127). Thus, her experience as Minister of Education not only saw improvements for girls' education within Mozambique at the time but also laid the foundation for her to become an internationally recognised activist for girls' education and women's empowerment.

5.4 Commonalities

Evident across all three case studies is the importance of the power and respect that a cabinet position brings in allowing women cabinet ministers to engage in international campaigns to improve girls'

education, both during and after their tenure. All three have also successfully implemented domestic policies, particularly regarding teen mothers. Thus, in all three cases there is evidence that their position as cabinet ministers allowed them to substantively represent the interests of women and girls. These case studies also provide insight into how and why the descriptive representation of women leads to their substantive representation. Examination of how Bah Diallo and Graça Machel's time as education ministers influenced their later advocacy for girls' education reveals that their time in office exposed to them the gaps between boys' and girls' enrolment and the number of young girls leaving or being expelled from school. Their understanding of these issues gained while in office led to their later international initiatives to address these issues. Examination of Janet Museveni's campaigns while in office also revealed the importance of coalition-building and inter-ministerial efforts in the substantive representation of women through the "Protect the Girl, Save the Nation" campaign. Thus, the descriptive representation of women in cabinet through these three women allowed for the substantive representation of women by providing domestic and international legitimacy with which to lead campaigns, being a vantage point from which to gain deeper understanding of issues facing the wider population of women and girls, and by allowing the formation of coalitions with other women ministers.

6. Discussion and Conclusion

This research sought to answer the question: can the descriptive-substantive link regarding women cabinet ministers be observed in non-democracies? It has done so by focusing on women cabinet ministers and their impact on women and girls' education, as cabinet ministers typically possess policymaking power above that of the legislature. To establish generalisable associations between the level of women's descriptive representation in cabinet and improved educational outcomes for women and girls, this research firstly took a quantitative approach utilising linear regression. To provide insight into *how* women cabinet ministers are able to substantively represent women's educational interests, this research then turned to three case studies of women education ministers, past and present. Taken together, these methods have provided a depiction of the existence and strength of the descriptive-substantive link in non-democracies.

Quantitative findings from section four found a positive association between levels of women's descriptive representation in cabinet and education expenditure, as well as the average years 15-24-year-old women spend in education. This section also found that these associations do not differ between states with varying levels of electoral competition, ranging from no elections to democracies. This suggests there exists a link between women's descriptive and substantive representation in both democracies, as is well established in existing literature, and in non-democracies. However, this section did not find strong evidence of a link between women's descriptive representation and the adult female literacy rate following a series of robustness tests. Regardless, this section demonstrated generalisable positive associations between women's descriptive representation and young women's time spent in education, indicating women cabinet ministers can have some positive effect on women's educational outcomes. The establishment of this association led this research to three case studies to uncover some of the ways in which women cabinet ministers can and have substantively represented women.

Section five therefore analysed the tenures of Janet Museveni, Aïcha Bah Diallo, and Graça Machel as education ministers of Uganda, Guinea, and Mozambique respectively. These case studies revealed the particular importance of the international respect and legitimacy afforded to them as cabinet ministers in allowing them to campaign for girls' education internationally, as well as domestically. Furthermore, study of Aïcha Bah Diallo and Graça Machel's time as education ministers demonstrates how their tenure in cabinet inspired their later activism for girls' education, and therefore how women's descriptive representation in cabinet can result in the substantive representation of women both during and after their time in office. This qualitative section thus established clearer causal links between women's descriptive representation and women-friendly education policy, focusing on the question of how women ministers can wield their position to substantively represent women. However, it is important to stress that these findings are not intended to be taken as generalisations – this section instead revealed detailed accounts of how three specific ministers have been able to substantively represent women.

Despite these interesting findings, it is important to recognise the limitations of this research. Firstly, given the observational nature of data used for section four's quantitative methods, it is vital to stress

that findings from this section are to be interpreted as associations rather than as causal effects. Thus, while usefully providing a great deal of breadth to this research, findings from the quantitative methods must be interpreted with caution. The use of case studies provided clearer, more detailed causal links between women's descriptive representation and improved educational outcomes, complementing the breadth of the quantitative methods. However, their restricted geographic area, with all three from Sub-Saharan Africa, does limit the findings of this research. Future research could therefore examine and compare cases of women cabinet ministers from multiple regions of the world. Furthermore, as the focus of this research was solely on women cabinet ministers, it has not explored in detail the importance of intersectionality within the descriptive-substantive link, or how other identities intersect with their identity as women to impact their policymaking. Thus, future research could examine the role of intersecting identities in women cabinet ministers' policymaking decisions.

Nevertheless, despite these limitations, this research has made important contributions to the study of women cabinet ministers and the descriptive-substantive link in non-democracies. To situate these findings in the existing literature, this research has offered an expansion on literature on the descriptive-substantive link by considering its existence in non-democracies. The quantitative element of this research supports the findings of Forman-Rabinovici and Sommer, and Mechkova and Edgell on women legislators in non-democracies, uncovering a similar descriptive-substantive link regarding women cabinet ministers (Forman-Rabinovici and Sommer, 2019; Mechkova and Edgell, 2024). However, unlike these studies, this research does not find level of electoral competition to be important to this link when focusing on women in cabinet and on education policy and outcomes. This may speak to the differences in policymaking power between legislators and cabinet ministers in non-democracies, given that the latter are typically appointed directly by the autocratic leader, rather than elected (albeit non-democratically) as legislators are.

By engaging with case studies, this research has expanded upon the quantitative works of Forman-Rabinovici and Sommer and Mechkova and Edgell by uncovering *how* some women ministers are able to substantively represent women. These findings have also expanded upon existing literature regarding how and why women in cabinet substantively represent women. Findings from section five provide

evidence that women ministers in non-democracies can use similar mechanisms to women in democracies: using it as a vantage point to gain better understanding of women's issues and as a position of power with which to prioritise them, and creating coalitions with other women ministers to amplify their advocacy for women's issues (Kanter, 1997: pp.996; Cowell-Myers and Langebin, 2009: pp.492). Furthermore, the case studies demonstrated the importance of the international legitimacy afforded to cabinet ministers in allowing women ministers in non-democracies to engage in and lead international initiatives for the betterment of the lives of women and girls.

The implications of this research are that women in cabinet in non-democracies have the potential to substantively represent women, even across varying levels of electoral competition. Thus, this research tentatively holds a positive outlook for the advancement of women's interests and rights in non-democracies via the representation of women in cabinet; even if appointed within an undemocratic system, women cabinet ministers can utilise this position, its power and international legitimacy to substantively represent the interests of women. With case studies demonstrating the importance of internationalism in these women's efforts to advance women's interests, this research suggests democracies around the world engage meaningfully with women cabinet ministers in non-democracies in their efforts to promote the global advancement of women's interests.

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Appendix

Table 5 Summary statistics of all variables used in this research

Variable	Observations	Mean/median/mode	Standard deviation	Min	Max	Countries
Proportion of female cabinet ministers	8741	.10	.12	0	.67	184
Expenditure of education (%GDP)	4731	4.37	1.95	0	44.3	191
Average years of education (15-24-year-old women)	7740	7.36	3.54	.48	16.1	193
Adult female literacy rate	922	75.5	25.2	3.39	100	159
Election type	11450	Democratic elections	N/A	N/A	N/A	200
GDP per capita (logged)	9494	7.68	1.72	2.55	12.4	198
Population growth	10397	1.73	1.68	-27.7	19.4	201
Communist/socialist state	11451	Not communist/socialist	N/A	N/A	N/A	200
Inflation	8216	23.6	333	-17.6	23773	190
Proportion of female primary teachers	5393	.62	.24	.02	1.0	195

Source: Quality of Government Institute, 2024

Table 6 Average marginal effects of women's descriptive representation in cabinet on education expenditure (%GDP), including effects of all controls

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers (1 year lag)	1.8***	1.2***	2.0***	1.3***
	(.40)	(.37)	(.43)	(.42)
Election type [A]				
No elections			-.60***	-.56***
			(.19)	(.19)
Single-party elections			.52	.49
			(.32)	(.39)
Non-democratic multi-party elections			-.03	-.09
			(.18)	(.17)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			-.34	-1.0
			(1.9)	(1.8)
Female cabinet ministers x single-party elections			1.6	-1.9
			(3.50)	(3.0)
Female cabinet ministers x non-democratic multi-party elections			-1.2	-.53
			(.74)	(.65)
GDP per capita (logged)		.16**		.14**
		(.37)		(.06)
Communist/socialist [B]		.48***		.08
		(.07)		(.29)
Population growth		.05		.05
		(.07)		(.07)
Inflation		-.00		-.00
		(.00)		(.00)
Intercept	4.1***	2.8***	4.1***	2.9***
	(.06)	(.51)	(.08)	(.50)
Observations	4375	4059	4375	4059
Countries	168	163	168	163
R-squared	.06	.13	.08	.14

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$

Source: Quality of Government Institute, 2024

Table 7 Average marginal effects of women's descriptive representation in cabinet on average years of education (15-24-year-old women), including effects of all controls

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers (1-year lag)	12***	3.8***	10***	3.5***
	(.49)	(.39)	(.44)	(.39)
Election type [A]				
No elections			-1.7***	-.55**
			(.20)	(.17)
Single-party elections			-1.6***	-.54**
			(.23)	(.18)
Non-democratic multi-party elections			-.96***	-.18
			(.23)	(.17)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			.98	1.5
			(3.0)	(1.5)
Female cabinet ministers x single-party elections			-3.1	.52
			(3.4)	(2.2)
Female cabinet ministers x non-democratic multi-party elections			1.2	-.11
			(1.0)	(.76)
GDP per capita (logged)		1.1***		1.1***
		(.10)		(.10)
Communist/socialist [B]		-.52**		-.25
		(.22)		(.22)
Population growth		-.12**		-.11**
		(.05)		(.05)
Proportion of female primary teachers (1-year lag)		6.2***		6.0***
		(.91)		(.89)
Intercept	6.2***	-5.0***	7.0***	-4.6***
	(.04)	(.59)	(.10)	(.56)
Observations	7029	3847	7029	3847
Countries	176	166	176	166
R-squared	.13	.80	.25	.80

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$

Source: Quality of Government Institute, 2024

Table 8 Average marginal effects of women's descriptive representation in cabinet on adult female literacy rate, including effects of all controls

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers (1-year lag)	42***	14**	22***	7.1**
	(4.9)	(4.3)	(3.9)	(3.1)
Election type [A]				
No elections			-15***	-7.9**
			(2.4)	(2.3)
Single-party elections			-12**	-6.6**
			(4.8)	(2.6)
Non-democratic multi-party elections			-4.4	.12
			(3.0)	(12.0)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			80***	33**
			(12)	(13)
Female cabinet ministers x single-party elections			16	13
			(30)	(17)
Female cabinet ministers x non-democratic multi-party elections			33**	5.4
			(10)	(8.5)
GDP per capita (logged)		2.6**		2.7**
		(.81)		(.81)
Communist/socialist [B]		-.08		4.8
		(5.5)		(4.4)
Population growth		-.96*		-.95**
		(.52)		(.44)
Proportion of female primary teachers (1-year lag)		88***		82***
		(7.7)		(8.0)
Intercept	69***	-1.5	74***	2.4
	(.66)	(5.5)	(1.3)	(6.5)
Observations	892	626	892	626
Countries	148	135	148	135
R-squared	.03	.79	.03	.79

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$

Source: Quality of Government Institute, 2024

Table 9 Average marginal effects of women's descriptive representation in cabinet on education expenditure (%GDP), with 5-year lag on proportional of female cabinet ministers

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers (5-year lag)	1.8***	1.1**	2.0***	1.3**
	(.40)	(.38)	(.43)	(.41)
Election type [A]				
No elections			.56**	-.50**
			(.18)	(.19)
Single-party elections			.51*	.47
			(.31)	(.38)
Non-democratic multi-party elections			.00	-.05
			(.18)	(.18)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			-1.0	-2.1
			(1.6)	(1.5)
Female cabinet ministers x single-party elections			1.2	-1.5
			(3.3)	(2.8)
Female cabinet ministers x non-democratic multi-party elections			-1.2*	-.83
			(.75)	(.68)
GDP per capita (logged)		.16**		.14**
		(.06)		(.06)
Communist/socialist [B]		.45***		.07
		(.07)		(.28)
Population growth		.06		.05
		(.07)		(.07)
Inflation		-.00		-.00
		(.00)		(.00)
Intercept	4.1***	2.8***	4.1***	3.0***
	(.05)	(.53)	(.08)	(.53)
Observations	4288	3993	4288	3993
Countries	167	162	167	162
R-squared	.06	.12	.08	.13

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$. Standard errors are displayed in parentheses below the coefficients

Source: Quality of Government Institute, 2024

Table 10 Average marginal effects of women's descriptive representation in cabinet on average years of education (15-24-year-old women), with 5-year lag on proportion of female cabinet ministers

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers (5-year lag)	12***	3.9***	11***	3.7***
	(.56)	(.42)	(.48)	(.46)
Election type [A]				
No elections			-1.8***	-.55**
			(.21)	(.17)
Single-party elections			-1.7***	-.52**
			(.23)	(.19)
Non-democratic multi-party elections			-.91***	-.19
			(.22)	(.17)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			-2.0	.10
			(3.2)	(1.1)
Female cabinet ministers x single-party elections			-1.97	.64
			(2.9)	(2.5)
Female cabinet ministers x non-democratic multi-party elections			.51	-.10
			(1.1)	(.79)
GDP per capita (logged)		1.1***		1.2***
		(.11)		(.10)
Communist/socialist [B]		-.58**		-.32
		(.23)		(.23)
Population growth		-.12**		-.12**
		(.05)		(.05)
Proportion of female primary teachers (5-year lag)		6.2***		5.0***
		(.59)		(.95)
Intercept	6.4***	-4.9***	7.2***	-4.4***
	(.04)	(.59)	(.10)	(.59)
Observations	6688	3826	6688	3826
Countries	174	166	174	166
R-squared	.13	.80	.26	.81

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Standard errors are displayed in parentheses below the coefficients

Source: Quality of Government Institute, 2024

Table 11 Average marginal effects of women's descriptive representation in cabinet on adult female literacy rate, with 5-year lag on proportion of female cabinet ministers

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers (5-year lag)	38***	3.9	20***	-2.6
	(4.9)	(4.5)	(4.0)	(3.1)
Election type [A]				
No elections			-16***	-6.3**
			(2.6)	(2.3)
Single-party elections			-13**	-8.5**
			(5.2)	(3.2)
Non-democratic multi-party elections			-4.7	-2.3
			(2.9)	(2.0)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			74***	13
			(19)	(14)
Female cabinet ministers x single-party elections			21	21
			(37)	(22)
Female cabinet ministers x non-democratic multi-party elections			34**	24**
			(9.6)	(9.0)
GDP per capita (logged)		3.1***		3.2***
		(.82)		(.81)
Communist/socialist [B]		2.0		7.2
		(8.6)		(8.0)
Population growth		-.78*		-.77*
		(.44)		(.45)
Proportion of female primary teachers (5-year lag)		87***		80***
		(7.4)		(8.1)
Intercept	71***	-4.6	75***	.63
	(.57)	(5.7)	(1.3)	(6.6)
Observations	882	611	882	611
Countries	148	133	148	133
R-squared	.01	.79	.02	.79

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Standard errors are displayed in parentheses below the coefficients

Source: Quality of Government Institute, 2024

Table 12 Average marginal effects of women's descriptive representation in cabinet on education expenditure (%GDP), with 1-year lag on education expenditure

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers	1.7***	.89**	1.8***	.10**
	(.40)	(.36)	(.42)	(.39)
Election type [A]				
No elections			-.65***	-.52**
			(.18)	(.17)
Single-party elections			.49	.44
			(.35)	(.42)
Non-democratic multi-party elections			.04	.04
			(.18)	(.18)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			.18	-1.1
			(1.7)	(1.7)
Female cabinet ministers x single-party elections			2.8	.87
			(3.8)	(3.2)
Female cabinet ministers x non-democratic multi-party elections			-1.2	-.75
			(.80)	(.70)
GDP per capita (logged)		.20**		.19**
		(.06)		(.06)
Communist/socialist [B]		.67***		.23
		(.14)		(.34)
Population growth		-.06		-.07
		(.06)		(.06)
Inflation		.00		.00
		(.00)		(.00)
Intercept	4.1***	2.6***	4.1***	2.7***
	(.06)	(.49)	(.09)	(.46)
Observations	4190	3900	4190	3900
Countries	168	163	168	163
R-squared	.07	.13	.08	.13

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Standard errors are displayed in parentheses below the coefficients

Source: Quality of Government Institute, 2024

Table 13 Average marginal effects of women's descriptive representation in cabinet on average years of education (15-24-year-old women), with 1-year lag on average years of education (15-24-year-old women)

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers	11***	3.8***	9.7***	3.5***
	(.47)	(.40)	(.43)	(4.0)
Election type [A]				
No elections			-1.7***	-.53**
			(.21)	(.17)
Single-party elections			-1.6***	-.49**
			(.24)	(.20)
Non-democratic multi-party elections			-.94***	-1.9
			(.23)	(1.7)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			1.6	1.8
			(3.3)	(1.5)
Female cabinet ministers x single-party elections			-2.5	.40
			(3.4)	(2.4)
Female cabinet ministers x non-democratic multi-party elections			1.2	-.00
			(1.0)	(.77)
GDP per capita (logged)		1.1***		1.1***
		(.10)		(.01)
Communist/socialist [B]		-.44**		-.21
		(.22)		(.22)
Population growth		-.13**		-.13**
		(.05)		(.05)
Proportion of female primary teachers		6.2***		6.0***
		(.90)		(.88)
Intercept	6.1***	-5.1***	7.0***	-4.7***
	(.05)	(.58)	(.10)	(.58)
Observations	7084	4053	7084	4053
Countries	176	167	176	167
R-squared	.14	.80	.24	.81

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Standard errors are displayed in parentheses below the coefficients

Source: Quality of Government Institute, 2024

Table 14 Average marginal effects of women's descriptive representation in cabinet on adult female literacy rate, with 1-year lag on adult female literacy rate

	Model 1	Model 2	Model 3	Model 4
Proportion of female cabinet ministers	38***	6.3	20***	-.25
	(4.9)	(4.8)	(4.1)	(2.6)
Election type [A]				
No elections			-15***	-5.7**
			(2.8)	(2.6)
Single-party elections			-11**	-2.3
			(3.2)	(4.4)
Non-democratic multi-party elections			-3.7	1.5
			(3.2)	(1.9)
Proportion of female cabinet ministers x election type [A]				
Female cabinet ministers x no elections			79**	32*
			(23)	(16)
Female cabinet ministers x single-party elections			2.9	-31
			(45)	(37)
Female cabinet ministers x non-democratic multi-party elections			31**	9.9
			(11)	(8.7)
GDP per capita (logged)		3.4**		3.3**
		(.99)		(.95)
Communist/socialist [B]		8.3		10*
		(7.0)		(6.2)
Population growth		-1.3**		-1.3**
		(.41)		(.38)
Proportion of female primary teachers		78***		73***
		(9.2)		(9.1)
Intercept	69***	.26	73***	3.2
	(.67)	(7.1)	(1.3)	(7.3)
Observations	815	573	815	573
Countries	148	132	148	132
R-squared	.02	.79	.02	.78

[A] Reference category is democratic elections

[B] Reference category is not a communist/socialist state

Note: Models 1-4 are linear regressions. ****$p < .001$ **$p < .05$ *$p < .10$ Standard errors are displayed in parentheses below the coefficients

Source: Quality of Government Institute, 2024