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CBS COPENHAGEN BUSINESS SCHOOL
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Abstract

Recent decades have seen a global rise in gender equality and social policy expansion. The expansion of social policy programs strengthens the commitment to gender equality. Subsequently, women are less constrained to traditional social roles and are encouraged to advance their careers in political and public life. These transformations have given rise to a substantial increase in women entering the political arena, which in turn has tremendous implications for social policymaking. This thesis examines the gendered origins and implications of social policies, building on a framing paper and three papers using methods such as instrumental variables, difference-in-differences, logistic regressions with marginal effects, and panel threshold models. The thesis draws on novel primary and secondary datasets with regard to an autocracy, a new democracy, and 153 countries worldwide.

Each paper addresses a related puzzle in the literature and empirically tests the theoretical framework it develops. The first paper investigates, on the micro level, the effect of China's educational expansion as a social policy implementation on authoritarian support and patriarchal values. The findings suggest that significant transformation from patriarchal to more liberal gender values is not often coupled with a decline in the diffuse authoritarian support. The second paper turns to a new democracy and explores, on the meso level, the effect of a gender-equality policy—gender quotas—on social policy legislation based on quota implementation on one electoral tier in Taiwan's mixed electoral system. Contrary to the conventional wisdom that women often represent women on issues closer to women's interests, the findings show that although gender quotas influence quota women profoundly in initiating welfare and health issues, a related effect cannot be observed for non-quota women. The third paper, on the macro level, examines the origins of gender quotas and the implications of gender quotas on social policy spending using a global sample of countries. The findings indicate that as women's political rights increase, international development assistance has an increasingly positive effect on quota implementation. Furthermore, the findings indicate that quota implementation and increased legislative presence of women are associated with an increase in health spending.

Taken together, by combining evidence from the micro to the macro level, this thesis investigates not only the implications of social policies on gender equality but also the implications of gender quotas—a gender-equality policy—on social policymaking. The thesis theoretically and empirically contributes to our understanding of how gender and social policies interplay.

Resumé

I de senere årtier er der sket en global stigning i ligestilling og ekspansion af socialpolitik. Det er dog ofte uklart, hvordan køn og socialpolitik spiller sammen i udviklingslandene. Denne afhandling undersøger de kønnede oprindelser og implikationer af socialpolitikke,framing paper og tre artikler, der bygger på originale og sekundære data i tilfælde af autokrati, nyt demokrati og over hele verden.

Hver artikel behandler et relateret puzzel i litteraturen og tester empirisk de dertilhørende udviklede teorirammer. På mikro-niveau undersøger den første artikel, hvordan og i hvilket omfang ekspansion af uddannelser på højere niveau som socialpolitisk program påvirker støtte til autoritære og patriarkalske værdier i Kina. Resultaterne tyder på, at socialpolitik ikke er en sølvkugle for det autoritære regime til at understøtte autoritære værdier. Resultaterne tyder desuden på, at betydelig transformation til mere liberale kønsværdier ikke altid er forbundet med et fald i den diffuse støtte til autoritære værdier. Den anden artikel fokuserer på et nyt demokrati og udforsker, hvorvidt gennemførelse af kønskvoter på et valgstrin i Taiwans blandede valgsystem har indflydelse på både kvinder, der er valgt via kvote og dem der ikke er i forhold til deres substantielle repræsentation vedrørende socialpolitiske spørgsmål. I modsætning til den konventionelle visdom om, at kønskvoter og kvinders sigende lovgivningsmæssige tilstedeværelse ofte får kvinder til at igangsætte kvindevenlige socialpolitiske lovforslag i lovgivende organer, viser resultaterne af dette studie, at dette kun er tilfældet for kvinder valgt via kvoter og en tilknyttet virkning kan ikke observeres for kvinder, der ikke er valgt via kvoter. Det tredje papir fokuserer på makroniveau, hvor det benytter sig af en global stikprøve af lande og undersøger oprindelsen af kønskvoter og vurderer, hvorvidt og hvordan kønskvoter og kvinders stigende lovgivningsmæssige tilstedeværelse påvirker udgifter til socialpolitik. Hvad angår kønskvoters oprindelse, tyder resultaterne på, at når kvinders politiske rettigheder øges, har international udviklingsbistand en stadig mere positiv effekt på gennemførelsen af kvoter. Med hensyn til implikationerne af kønskvoter og kvinders lovgivningsmæssige tilstedeværelse for så vidt angår socialpolitiske udgifter indikerer de empiriske beviser, at gennemførelsen af kønskvoter og øget lovgivningsmæssig tilstedeværelse af kvinder er forbundet med en stigning i sundhedsudgifter.

Ved hjælp af en kombination af evidens på mikro- og makroniveau har denne afhandling ikke alene undersøgt implikationerne af socialpolitik for ligestilling mellem kønnene, men også betydningen af ligestillingspolitik i form af kønskvoter på socialpolitik. Denne afhandling bidrager teoretisk såvel som empirisk til vores forståelse af, hvordan køns- og socialpolitik interagere.

Contents

Chapter 1

Introduction

The first wave of feminism during the 19th and early 20th century mainly concerned women's suffrage in the Western world. The recent waves of feminism center on equal opportunities for women in education, work, and public life in both the developed and developing world (Iversen, Rosenbluth, & Rosenbluth, 2010; Lovenduski, 1998). With the decline in traditional gender roles, women increasingly obtain educational opportunities and participate in the labor market, generating a transformation from male-breadwinner to dual-earner households. Past decades have therefore given rise to the expansion of social policies that strengthen the commitment to gender equality by recognizing and accommodating women as both workers and caretakers (Lewis, 1992). Subsequently, women are less constrained to traditional social roles related to family, children, and marriage and are more encouraged in self-expression and career advancement in private and public life (Inglehart & Norris, 2003). These transformations have given rise to a substantial increase of women entering the political arena, which in turn has tremendous implications for social policymaking.[1] Although extensive literature has documented crucial evidence revealing the relationships between gender and social policies (Fleckenstein & Lee, 2014; Mandel & Semyonov, 2006; McKay, 2001; Sainsbury et al., 1999), some key questions remain unexplored: What are the gendered origins and implications of social policies? More specifically, how does social policy expansion influence gender equality; conversely, how and to what extent do gender-equality

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[1]Social policies such as health, education, and welfare policies are historically considered women's interests (Schwindt-Bayer, 2006; Volden, Wiseman, & Wittmer, 2018).

policies such as gender quotas influence social policymaking?

In answering these questions, standard explanations in political science and sociology tend to draw on evidence from the advanced industrialized world. In these models, the postindustrial gender-egalitarian social policies lead to a transition toward greater gender equality, and it is commonly presumed that only advanced industrialized societies are currently undergoing this transformation. However, relationships between gender and social policies exist beyond the simplistic distinction between the developed and developing world. As presented in later chapters, these relationships are also valid in the developing world.[2] Moreover, these relationships show various interesting patterns based on different regime types and levels of analysis.

Paper 1 explores the gendered implications of a specific social policy—higher education expansion—in an autocracy. It bridges the literature on social policies with research on authoritarian values. Although the world has experienced a tremendous expansion of social policies, a striking pattern has emerged: An overwhelming number of cases of social policy expansions can be found in autocracies(Lü, 2014; Mares & Carnes, 2009). These social policy expansions, for instance, are observed in Latin America, Asia, and Africa, as well as in contexts as divergent as Communist China and Brazil under the military rule in the 1970s. Although conventional wisdom claims that social policy expansion is associated with democratic transition and greater gender equality (Inglehart, 1997; Inglehart & Welzel, 2005; Lipset, 1959), recent studies have emphasized the role of social policies as an effective tool to garner authoritarian values and support (Acemoglu & Robinson, 2005; De Mesquita Bruce, Smith, Siverson, & Morrow, 2003; Knutsen & Rasmussen, 2018; Lü, 2014). These arguments can simply be paradoxical: Authoritarian social policy expansion both preserves and undermines authoritarianism. Based on higher education expansion as a social policy implementation in an autocracy, Paper 1 in this thesis assesses this paradox.

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[2]This thesis classifies the developed and developing world based on the criteria by Finkel, Pérez-Liñán, and Seligson (2007). According to Finkel et al. (2007), countries are classified as developing countries if: (1) they are classified by the World Bank as low or middle income; (2) they have an average Freedom House score equal to or higher than three; (3) they are recently established democracies; or (4) they are recipients of USAID.

Instead of focusing on a single dimension of authoritarian values, the paper centers on both authoritarian support and authoritarian patriarchal values and asks, "How does a specific social policy implementation in an autocracy influence authoritarian support and gender inequality?"

Paper 2 turns the focus to a new democracy and examines the gendered origins of social policies. I leverage insights from the effect of a reserved-seat quota implementation on social policy legislation. In the past decade, a vast majority of reserved seats were implemented in new democracies and autocracies, particularly in Asia and Africa.[3] On the one hand, reserved seats might effectively increase the legislative presence of women and translate women's descriptive representation (number of women in legislatures) into substantive representation (advancement of women's interests, e.g., social policies in national legislatures). On the other hand, quota implementation in new democracies and autocracies leads to the argument that implementing gender quotas serves the strategic purpose of signaling modernity through compliance with global gender norms (Donno & Kreft, 2019; Krook, 2013; Tripp & Kang, 2008) rather than committing to gender equality and increasing women's substantive representation by legislating women-friendly policies. Paper 2 investigates this debate by asking how, and to what extent, quota implementation in a new democracy leads to the legislative initiation and enactment of social policy issues.

In Paper 3, I expand the gendered origins of social policies to the global level for broader scrutiny. While reserved-seat quotas are commonly found in many new democracies and autocracies, to date, over 130 countries worldwide have implemented electoral gender quotas in the form of voluntary party quotas, candidate list quotas, or reserved seats (Hughes, Paxton, Clayton, & Zetterberg, 2017). Quota implementation has largely increased the legislative presence of women in national legislative bodies worldwide. Although the origins and implications of gender quotas as a global phenomenon have intrigued many scholars for the past decade (Agerberg & Kreft, 2020; Bush, 2011; Clayton, Josefsson, & Wang,

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[3]These new democracies and autocracies that have recently implemented reserved seats include Bangladesh, Burundi, China, Egypt, Iraq, Jordan, Kenya, Morocco, Niger, Uganda, Taiwan, Tanzania, Sudan, Saudi Arabia, Rwanda, and Pakistan.

2017; Hughes & Tripp, 2015), a blind spot in the current literature and debate is whether the argument—that gender quotas and the increased legislative presence of women can be translated into social policymaking—also applies on a global level. To examine the global diffusion and implications of gender quotas, Paper 3 broadens the scope of empirical focus. Instead of focusing solely on an autocracy or democracy, this study draws on macro-level evidence using an original dataset from 153 countries. Moving beyond single case studies, the paper assesses the pathways to global quota implementation and explores the implications of gender quotas and the legislative presence of women on social spending.

This thesis contributes to the growing research agenda on gender and social policy. It focuses not only on the effect of a specific social policy on gender equality (Paper 1), but also on the effect of gender quotas—a policy designed for gender equality in elected legislative bodies—on social policymaking (Papers 2 and 3). Just as we want to know whether social policies such as educational expansion are women friendly and bring about greater gender equality even in an authoritarian context, we also need to know whether the global spread of gender-equality policies such as gender quotas is merely a symbolic gesture. Against this backdrop, the research questions this thesis seeks to address are summarized below in Table 1. As presented in this table, three sub-questions (SQ) are derived from the main research question.

Table 1: Research Questions

Main Research Question:	
	What are the gendered origins and implications of social policies in the developing world?
Sub-questions:	
Paper 1	How, and to what extent, does a specific social policy influence authoritarian support and patriarchal values in an autocracy?
Paper 2	How, and to what extent, do gender quotas affect the legislative initiation and enactment of social policies in a new democracy?
Paper 3	What explains the global diffusion of gender quotas? How, and to what extent, do gender quotas and the increased legislative presence of women affect social spending worldwide?

Logically, these sub-questions echo an approach of coalescing level of analysis, which

links the three papers. Table 2 illustrates this link in detail. Specifically, this thesis shifts from a micro approach at the level of individual people (Paper 1) to a meso approach based on legislator-level evidence in a single legislature (Paper 2) and finalizes with a macro approach at the level of individual countries (Paper 3).[4] This systematic approach drawing on evidence from the micro to the macro level connects the three papers from quantitative single-case studies to large-N cross-national accounts. The relationships between gender and social policies could exist in crosscutting settings and across regime types. Accounting only for empirical evidence on the aggregate level often fails to elucidate the within-country variations in gender equality or the nature of the state, which could potentially bias the results. Without a clear systematic approach to link different cases under study, the findings in these three papers are likely to be dispersed and difficult to connect. For these reasons, my thesis combines micro- to macro-level analyses to assess the relationships between gender and social policies.
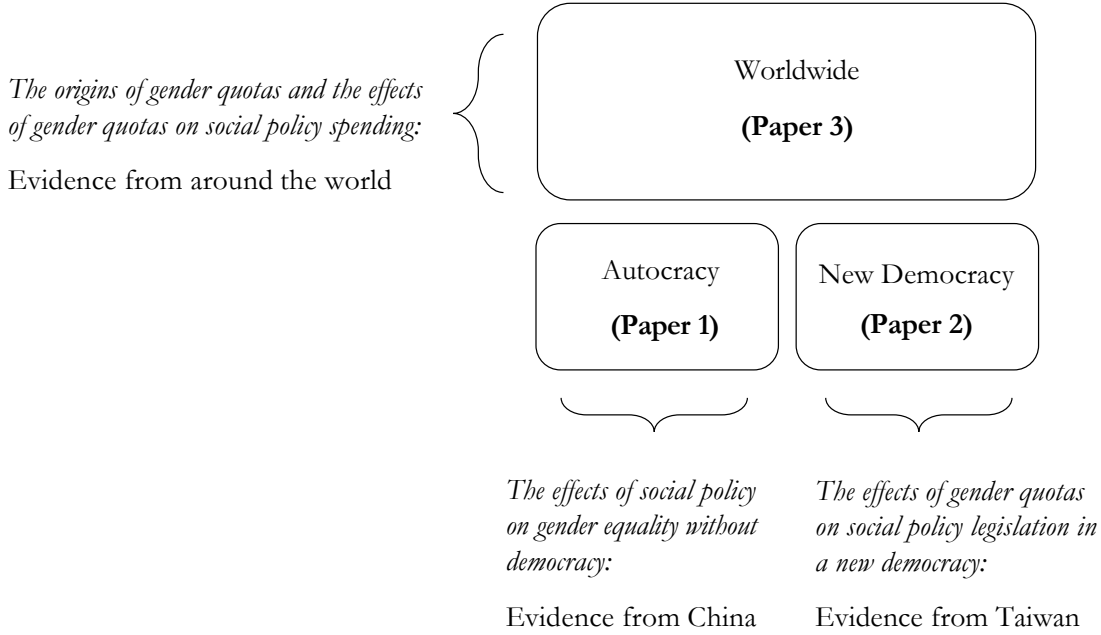
Table 2: The Links between the Papers: A Level-of-Analysis Approach

Level of analysis	Paper	Research question
Micro *Individual level*	Article 1. *Gender Equality without Democracy? Evidence from a Social Policy Expansion*	SQ 1
Meso *Legislator level in a single legislature*	Article 2. *Effects of Gender Quotas on Women's Substantive Representation of Social Policy Issues*	SQ 2
Macro *Country level*	Article 3. *Global Diffusion of Gender Quotas, Women's Legislative Presence and Social Policy Spending*	SQ 3

Figure 1 illustrates the case selection strategy for the thesis. Following the case selection techniques by Seawright and Gerring (2008), two strategies were borne in mind throughout

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[4]Here, it is important to clarify the difference between "unit of analysis" and "level of analysis." Whereas the former is used to point to the unit of observation and research population, the latter refers to the location or scale of a research design (Singer, 1961).

Figure 1: Case Selection Strategy

The origins of gender quotas and the effects of gender quotas on social policy spending:

Evidence from around the world

	Worldwide **(Paper 3)**	
	Autocracy **(Paper 1)**	New Democracy **(Paper 2)**

The effects of social policy on gender equality without democracy:

Evidence from China

The effects of gender quotas on social policy legislation in a new democracy:

Evidence from Taiwan

the process of case selection. The first strategy relates to representativeness, which indicates that the goal of the case selection is to reflect on the external generalization to the broader population. The second strategy concerns variation. In the words of Seawright and Gerring (2008), "chosen cases must also achieve variation on relevant dimensions." In light of these case selection strategies, Paper 1 explores the effect of a specific social policy on authoritarian support and patriarchal values based on the context of an autocracy. I leverage the case of China, where a large-scale social policy—higher education expansion—was introduced in 1999. As elaborated in the paper, China's higher education expansion parallels a "most likely case" to extend the line of studies on social policy and authoritarian values, because in an information-controlled closed autocracy, it is likely for authoritarian leadership to use social policy to maintain a high level of authoritarianism. With respect to representativeness, China's higher education expansion parallels similar expansion of social policies as a strategy to garner authoritarian values in other autocracies or historically authoritarian systems.[5] Paper 2 turns to the case of gender quota implementation in a new democracy and explores

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[5]For instance, similar cases can be found in Kenya recently (Falleti, 2009) and in Brazil in the 1970s under the military rule (Harding & Stasavage, 2013).

the quota effect on social policy legislation. To do so, I consciously select the case of quota implementation in Taiwan, a new democracy with a mixed electoral system, where reserved-seat quotas were implemented in the closed-PR tier. Drawing on the case of quota implementation in one tier of a mixed system allows me to empirically discern variations of the quota effect on legislative behavior between different types of legislators: quota-women, non-quota women, and men elected to the quota tier. Furthermore, the case of quota implementation in Taiwan resembles other cases of quota implementation in new democracies with mixed electoral systems. For instance, as detailed in Paper 2, similar cases can be found in both the Mexican lower house and South Korean legislature. This case selection, therefore, goes beyond specific context and allows for offering new general knowledge about the quota effect on social policy legislation. Paper 3 moves beyond single case studies. On a global level, it assess the origins of gender quotas and the quota effect on social policy spending. In this way, it extends the representativeness of the quota effect on social policymaking to the global level, which largely reduces the threat to external validity of the findings.

As shown in Table 3, the empirical relationships, empirical focus, and methods employed in this thesis further connect the three papers. Regarding empirical focus, the thesis focuses on three areas of social policies: education (covered in Papers 1, 2, and 3), health (Papers 2 and 3), and social welfare (Paper 2). Existing literature has documented that women politicians pay greater attention to these social policies than their male counterparts do. For example, Schwindt-Bayer (2006) reveals that, in Latin America, female parliamentarians are more likely to focus on education, health, and social welfare issues than on economic, fiscal, and agriculture issues. Clots-Figueras (2012) shows that women particularly prefer social policy areas such as health and education. Concerning empirical relationships, this thesis identifies a mechanism that explains how social policies affect gender equality, and how gender-egalitarian quota policies, in turn, affect social policymaking. Methodologically, the thesis puts forward research designs that accommodate these empirical relationships, based on different primary and secondary datasets. Specifically, I draw on various micro-

Table 3: The Links between the Papers: Empirical Relationship, Empirical Focus, and Method

Paper	Empirical Relationship	Empirical focus	Method
1	Social policy → gender equality	Education expansion	Instrumental variable Logistic regressions with marginal effects
2	Gender quotas → social policy	Education, health, and social welfare	Instrumental variable Extended difference-in-differences Logistic regressions
3	Gender quotas → social policy	Education and health	Panel threshold models Generalized difference-in-differences Logistic regressions with marginal effects

Note: Darker areas indicate the effects of a gender-equality policy—gender quotas—on social policymaking. Lighter parts, reciprocally, indicate the effects of social policy on gender equality.

level survey data, legislative records, regional statistics, and macro country-level indicators. Moreover, I employ various quantitative methods, including logistic regressions with marginal effects, difference-in-differences, instrumental variable, and fixed-effects models.

Taken together, this thesis develops a novel research agenda. The analyses combine micro-, meso-, and macro-level evidence on the relationships between gender and social policies. The thesis seeks to construct arguments disentangling distinct gendered institutional factors and assess how these factors and social policies interplay. Based on the context of an autocracy, a new democracy, and worldwide, this study is able to empirically extend external validity and provide a complete picture of these relationships.

Chapter 2

The Core Concepts

In exploring the relationships between gender and social policies, some conceptualizations are presented. This section reviews a number of conceptual distinctions this thesis develops. I begin by discussing the main explanatory variable (educational expansion) and the outcome variables (authoritarian support and patriarchal values) in Paper 1. Subsequently, I discuss one fundamental concept employed in Papers 2 and 3—women's representation. I further discuss how different dimensions of women's representation are related to social policies.

Higher Education Expansion as a Social Policy Implementation

Previous literature has documented the effect of educational expansion on authoritarian values (De La O, 2013; Dunning, 2008; Harding & Stasavage, 2013; Lü, 2014; Mares & Carnes, 2009). In less industrialized societies, instead of preserving or upgrading class structure, education supplies individuals with basic skills to meet the rising labor demand and protect them against unemployment and social exclusion. Educational expansion can be seen as a beneficial social policy that invests in human capital and facilitates skill formation and labor market participation. Educational expansion is, therefore, often strategically implemented by autocrats to garner support (Lü, 2014; Mares & Carnes, 2009). Considering educational expansion as a social policy program, the multifaceted dimensions of educational expansion

require particular attention, which boils down to a more nuanced conceptualization based on specific context.

In light of this, I conceptualize educational expansion as having two crucial dimensions—temporal variation and spatial decentralization. Spatial decentralization is an important dimension because, in the case of China, the provision of social policy is largely decentralized across local governments at the provincial level. Underscoring the importance of China's social policy decentralization is well in line with the existing literature (Lü, 2014; Mattingly, 2016; Thun, 2004). The term spatial decentralization is operationalized as higher education intensity, referring to the standardized number of university enrollment at the provincial level. In practice, in regions where higher education resources are scarcer, the expansion is less effective. The operationalization, therefore, well captures the inter-provincial differences in higher education provision, which are related to access to higher education. The other dimension of educational expansion—temporal variation—is operationalized as age cohort, which refers to the cohort exposed to the expansion program. This operationalization follows a number of studies examining the effects of educational expansion using a cohort as a crucial measure (J. D. Angrist & Keueger, 1991; Becker, 2003; Breen & Jonsson, 2007; Card, 2001; Duflo, 2004).

Importantly, I argue that these two dimensions of educational expansion affect attitudes through two mechanisms—social policy benefit and social policy spillover. Specifically, social policy benefit refers to the benefit generated to the social policy beneficiaries. Past studies have evaluated the importance of a policy benefit effect and regarded it as a pivotal mechanism through which policy influences attitudes (Miller, Hesli, & Reisinger, 1994; Peterson & Rom, 1989) because receiving policy benefits is likely to generate opinion favorable to the incumbent government. Social policy spillover, on the other hand, refers to the spread of favorable opinion to the policy non-beneficiaries (Acemoglu, 1996; Moretti, 2004). In sum, utilizing various dimensions and mechanisms of educational expansion well captures educational expansion as a social policy implementation.

Authoritarian Support and Patriarchal Values

A systematic operationalization on authoritarian values is developed. Figure 2 illustrates in detail the conceptualization framework. The operationalization of authoritarian support and patriarchal values was derived from the background concept of authoritarian values.

Figure 2: A Conceptualization Framework of Authoritarian Values in Paper 3—"Gender Equality without Democracy?"
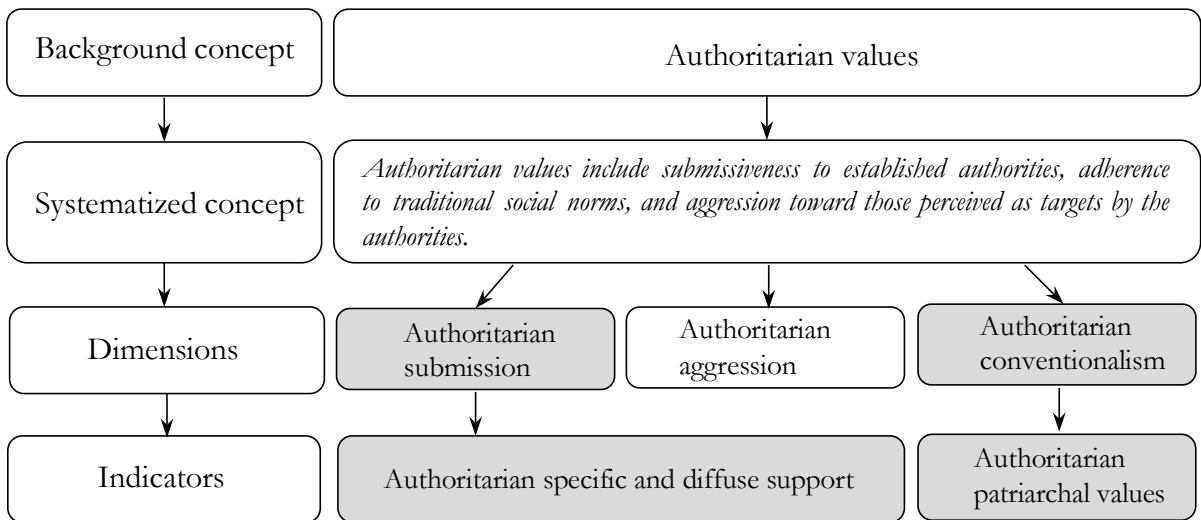
Note: The idea of mapping out and connecting background concept, systematized concept, dimensions, and indicators was derived from the study by Adcock and Collier (2001). The darker areas highlight the concepts covered by the thesis.

Adorno, Frenkel-Brenswik, Levinson, and Sanford (1950) introduced the influential concept of authoritarian personality. Thereafter, the idea of authoritarian values as a systematic concept was well received in political psychology (Altemeyer, 1988, 1996; Duckitt & Bizumic, 2013; Suziedelis & Lorr, 1973) and sociological literature (Stubager, 2008; Weil, 1985). Altemeyer (1988) defines authoritarian values as having three key dimensions: authoritarian aggression, submission, and conventionalism. According to this definition, authoritarian submission concerns submissiveness to established authorities; authoritarian conventionalism involves adherence to traditional social norms; and authoritarian aggression deals with aggression toward those perceived as targets by authorities (Altemeyer, 1988, 1996). This thesis is concerned with the former two dimensions of authoritarian values—authoritarian submission and conventionalism.

First, I discuss the conceptualization of authoritarian support. By and large, author-

itarian submission takes the form of supporting the established authoritarian regime and obeying autocrats without questioning their leadership. Here, I operationalize authoritarian submission as authoritarian support. Consistent with the conceptual distinction by Easton (1965, 1975), I further conceptualize authoritarian support as having two distinct indicators: specific and diffuse authoritarian support. Specific authoritarian support refers to ongoing support for authoritarianism, including the positive opinion of authoritarian policy and leadership. Diffuse authoritarian support, on the other hand, pertains to a stable and long-term adherence to the authoritarian system, regardless of its current policy and performance. Hence, diffuse support is, by definition, different from specific support. It is important to unbundle specific and diffuse authoritarian support. One possible explanation for the mixed evidence on the social policy effect on authoritarianism is that using the aggregate concept of authoritarian values is often inaccurate (Ciftci, 2010). Specific indicators, therefore, must be considered.

Second, I move on to authoritarian patriarchal values. Past studies have defined authoritarian conventionalism as "adherence to the social conventions perceived to be endorsed by society and authorities" (Altemeyer 1981, p.148), which include race, gender, and ethnicity. At the core of authoritarian conventionalism is the attitude toward traditional gender roles, which have long been central to the studies of authoritarianism (Duncan, Peterson, & Winter, 1997; Frenkel-Brunswik, 1952; Sanborn & Thyne, 2014; Whitley Jr, 1999). Simply defined, authoritarian patriarchal values refer to the attitudes toward traditional gender roles. Traditional gender roles concern the traditional roles men and women are expected to play in society, often described as "separate spheres of influence for women and men—women in the home, men outside the home" (Duncan et al., 1997). Importantly, while authoritarian conventionalism does not only incorporate patriarchal values as an indicator, authoritarian patriarchal values are a highly pertinent concept because, in autocracies, the shaping of gender equality often empowers women to take a major part in pushing for democratic transformation (Sanborn & Thyne, 2014). Historically, in these situations, women often organized the very first protests (Waylen, 1994). For example, these women's protests can
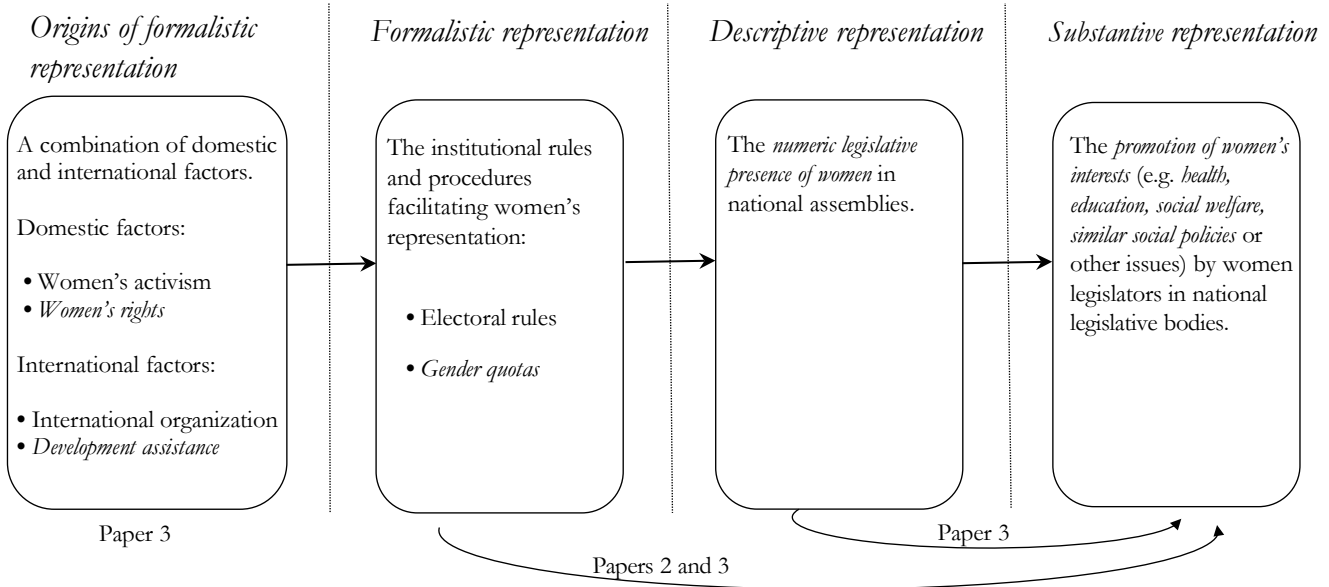
be found as far back as the 1970s and 1980s in Argentine, El Salvador and Chile, where mothers' groups took to the street and protested against the authoritarian military regimes in order to address abuses against human rights (Sanborn & Thyne, 2014; Waylen, 1994).

Women's Representation: Gender Quotas and Social Policymaking

Subsequently, I present a systematic conceptualization of women's representation. Figure 3 outlines this conceptualization framework in detail. Pitkin (1967) was the first to differentiate four dimensions of women's representation, including symbolic representation, formalistic representation, descriptive representation, and substantive representation. According to Pitkin (1967), symbolic representation refers to the way a representative represents the represented; formalistic representation refers to the institutional rule that arranges the way a representative is elected; descriptive representation refers to the similarity between a representative and the represented; and substantive representation refers to how a representative acts on behalf of the represented. Building on Pitkin's conceptualization, this section unfolds the operationalization of women's substantive representation in the thesis. Furthermore, links are provided between different dimensions of women's representation, relating to the relationships between gender and social policies that this thesis seeks to explore.

As shown in Figure 3, the conceptual framework of women's representation builds on four steps: origins of formalistic representation, formalistic representation, descriptive representation, and, finally, substantive representation. Central to the notion of formalistic representation is the origins of formalistic representation. Paper 3 explains the origins of formalistic representation such as gender quotas as the outcome of an interaction between domestic women's political rights and international development assistance. Domestic women's political rights are defined as women's rights to vote, join parties, petition, run for office, and hold government positions (Cingranelli, Filippov, & Mark, 2018). This definition distinguishes the characteristics of women's political rights that are built on law and policies

Figure 3: Four Steps to Conceptualize Women's Representation

Origins of formalistic representation	Formalistic representation	Descriptive representation	Substantive representation

Origins of formalistic representation

A combination of domestic and international factors.

Domestic factors:

- Women's activism
- *Women's rights*

International factors:

- International organization
- *Development assistance*

Paper 3

Formalistic representation

The institutional rules and procedures facilitating women's representation:

- Electoral rules
- *Gender quotas*

Descriptive representation

The *numeric legislative presence of women* in national assemblies.

Substantive representation

The *promotion of women's interests* (e.g. *health, education, social welfare, similar social policies* or other issues) by women legislators in national legislative bodies.

Paper 3

Papers 2 and 3

Note: The concepts used in the thesis are italicized.

instead of on gender norms or societal changes that are difficult to observe. International development assistance is defined as the value of net official development assistance that a country has received.

By definition, formalistic representation involves electoral rules and procedures through which a representative is elected. This thesis focuses on gender quotas as an important component of formalistic representation. Gender quotas are defined as an institutional rule requiring women to constitute a certain percentage of the national legislative body. Institutional designs such as electoral rules can contribute to the entry of minority candidates.[6] The use of gender quotas has also been effective in bringing women into the political sphere (Schwindt-Bayer, 2009). In other words, gender quotas (formalistic representation) often increase the percentage of women in legislatures (descriptive representation). Women's descriptive representation is defined as the numeric legislative presence of women in national legislative assemblies (Schwindt-Bayer & Mishler, 2005). Importantly, this thesis is largely concerned with how gender quotas as a form of formalistic representation are related to women's substantive representation. Substantive representation, in the literature of gender

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[6]For instance, the PR system (proportional representation) is regarded as more open to the minority candidates than the majoritarian system (Lijphart, Aitkin, et al., 1994).

and politics, is defined as the promotion of women's policy concerns, including social policies by women legislators in national legislative bodies (Celis, Childs, Kantola, & Krook, 2008; Franceschet & Piscopo, 2008; Swers, 2005; Wängnerud, 2009). Particularly, this thesis focuses on women's substantive representation in the form of legislative bill sponsorship and co-sponsorship on social policy issues (Paper 2) and government social policy spending (Paper 3). As Pitkin (1967) puts it, "expect the composition [of a national legislative body] to determine the activities." By doing so, this thesis examines whether gender quotas (formalistic representation) and women's increased numeric presence (descriptive representation) lead to women legislating women-friendly social policies (substantive representation).

Chapter 3

Theoretical Arguments

This section introduces the main theoretical arguments developed in the thesis. I first theorize the effect of educational expansion as a social policy implementation on authoritarian support and patriarchal values (Paper 1). Subsequently, I discuss the effect of electoral gender quotas, in turn, on social policymaking. I unfold the theoretical arguments underpinning this effect from the perspectives of micro-level foundations (Paper 2) and macro-level implications (Paper 3). Commonly revolving around the relationships between social policy and gender, these two theoretical arguments closely intertwine.

Gender Equality without Democracy? Educational Expansion and Authoritarian Values

Does educational expansion as a social policy program decline authoritarian support and authoritarian patriarchal values? Explanations for authoritarian attitudes center on various factors, including childhood experiences (Adorno et al., 1950), socially learned personality attributes (Altemeyer, 1996), and strong social attachment to conformity moderated by levels of threat (Feldman, 2003; Feldman & Stenner, 1997). Despite a plethora of literature explaining the shaping of authoritarian values, studies tend to focus on a broad strand of arguments: the modernization theories. Proponents of modernization theories argue that improvement in socioeconomic conditions leads to the rejection of authoritarian values

(Inglehart, 1997; Inglehart & Norris, 2003; Inglehart & Welzel, 2005, 2010; Lipset, 1959, 1960). To support this argument, these studies predominantly draw evidence from cross-sectional comparisons, proposing that higher education is correlated with a decrease in authoritarian values.

However, "not all scholars are ready to assume that education leads to the breakdown of authoritarian values" (Sanborn & Thyne, 2014). The cross-sectional analyses cannot completely rule out certain unobserved country-specific factors that are related to education attainment. These factors include worthiness of education, welfare system, social capital, and information availability (Sanborn & Thyne, 2014). The relationship between education and authoritarian values, therefore, can be spurious. To challenge the modernization argument, studies have carefully established causality through solid research designs. Acemoglu and Robinson (2005) find that the relationship between education and democracy vanishes when country-fixed effects are added in the models, suggesting that this relationship is highly subjective to omitted variable bias. Relatedly, Sanborn and Thyne (2014) illustrate that autocrats must weigh the human capital accumulation and economic growth brought by education against their authoritarian survival. The former increases autocrats' incentives to expand education because it can accumulate skills and wealth (Glaeser, Ponzetto, & Shleifer, 2007; Mares & Carnes, 2009), which can relieve critical supporters' fear of expropriation and help solidify power (Haber, Maurer, & Razo, 2003; Knutsen & Rasmussen, 2018).

For one, education is expected to influence authoritarian support. For another, education may simultaneously affect authoritarian patriarchal values. Studies have explored the role of education in reducing patriarchal values as part of internalizing democratic norms, which is referred to as the education-as-liberation argument. In practice, education provides individuals with more knowledge about gender equality (Quinley & Glock, 1979, p.188). Most importantly, education challenges the traditional male breadwinner model by providing women with skills to access the labor market (Hannum & Buchmann, 2005). This is also in line with the more general argument by Lipset (1959, 1960), who argues that edu-

cation increases exposure to diversity and decreases the tendency toward authoritarianism. Along these lines, Inglehart and Welzel (2005, 2010) argue that education and socioeconomic improvements alter individuals' attitudes from survival to self-expression values, such as support for democracy and gender equality. Based on these arguments, an implicit assumption is that support of democracy and gender equality seem to arise simultaneously following educational expansion. One may ask, however, if educational expansion as a social policy decreases authoritarian support and authoritarian patriarchal values.

The competing argument mostly focuses on two perspectives. First, according to Jacob (1957), the values brought by education may not be easily internalized; rather, in common cases, they are a form of socialization only used to meet college expectations. Sullivan, Piereson, and Marcus (1982) illustrate, based on the US context, that education does not result in a decline in attitudes toward traditional gender roles. Second, the education-as-liberation argument can be questioned through the lens of possible institutional conditioning factors that may affect the relationship between education and gender attitudes. For example, Morrisson and Jütting (2005) argue that the scope of education generating gender equality is limited in regions where patriarchal institutions still exist. The thesis advances this line of arguments by specifically incorporating relevant temporal and geographical variations to examine the effect of a large-scale educational expansion on authoritarian support and patriarchal values.

Quota Mechanism: The Micro-level Foundations

After summarizing the theories underpinning the effect of a specific social policy on gender equality and authoritarian support, this section, in turn, explores the effect of gender quotas on social policymaking. It first theoretically lays out the micro-level foundations for a quota mechanism. Early literature on the politics of presence has theorized a relationship between the legislative presence of women (descriptive representation) and their substantive representation on issues close to their interests (Phillips, 1995). According to this line of argument about their common experiences, women politicians construct their shared priorities on so-

cial policies such as education, health care, and social welfare. A growing body of literature has revealed evidence supporting the argument on the relationship between women's descriptive and substantive representation (Bratton & Ray, 2002; Clayton, Josefsson, Mattes, & Mozaffar, 2019; Ennser-Jedenastik, 2017; Franceschet & Piscopo, 2008; Schwindt-Bayer, 2006; Volden et al., 2018). A couple of studies have further disaggregated such substantive representation into two components: legislative initiative and outcome. The findings on legislative initiative and outcome, however, do not concur. For instance, some studies have revealed that although the legislative presence of women increases the legislative initiative of social policy issues, it does not lead to the successful passage of these issues (Franceschet & Piscopo, 2008; Volden et al., 2018).

My theoretical framework diverges from the early theory by accounting for formalistic representation (the way women legislators are elected) into the descriptive–substantive relationship. Early theories on the descriptive–substantive link implicitly assume that women are more likely to represent other women on issues closer to women's interests. The theoretical framework I develop adds a more nuanced layer to these interpretations. I argue that formalistic representation, such as gender quotas, is expected to affect women's legislative behavior on representing women—prioritizing women's issues such as social policies—throughout the legislative process. In what follows, I summarize the micro-level foundations of this quota mechanism.

Moving beyond the early presence accounts, I develop a theoretical framework incorporating gender quotas—a crucial dimension of formalistic representation—into the descriptive–substantive representational argument. As summarized in Figure 4, I divided my arguments on the quota mechanism into three main arguments: quota-mandate effect, gender effect, and quota-hindering effect. In this way, my argument theoretically distinguished the legislative behavior on social policy legislation between quota women, non-quota women, and male legislators elected to the quota tier.

First, I theorize that quotas generate a quota-mandate effect for quota women to act on the behalf of women. While quotas may generate a labeling effect demotivating quota

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Figure 4: A Theoretical Framework for a Gender Quota Mechanism

	Quota tier	Non-quota tier
Women	Quota women (Mandate effect)	Non-quota women (Gender effect)
Men	Men elected to the quota tier (Hindering effect)	Men elected to the non-quota tier

legislators from pursuing women's interests (Childs, 2004; Krook, 2013), studies shed light on the positive relationship between gender quotas and policies closer to women's interests. For instance, through rich qualitative analysis in the context of Latin America, Franceschet and Piscopo (2008) propose a quota mandate, suggesting that quota women tend to show a mandate to act on women's behalf. Built on quasi-experimental evidence from India, the groundbreaking study by Chattopadhyay and Duflo (2004) shows that quota women prefer policies to be aligned with women's interests. At the macro level, using a global sample, Clayton and Zetterberg (2018) find that quota adoption increases public health spending. Crucially, although Franceschet and Piscopo (2008) have introduced a quota mandate effect, as Childs and Krook (2012) put it, their study is "not able to distinguish between quota and non-quota women." Surprisingly, the existing theoretical framework has rarely discerned the legislative behavior between quota and non-quota women. By discerning between legislators' gender and electoral tier, I first theorize that quotas have a mandate effect on quota women to introduce and enact more social policy issues than any other legislators.

Furthermore, I theorize that a related effect exists for non-quota women. To motivate this argument, I argue that women are more collaborative as the number of women grows. This line of argument derives from the early studies on gender and politics (Dahlerup,

1988; Kanter, 1977), which highlights the significance of a threshold effect. For instance, Kanter (1977) argues that increasing the percentage of minorities is pivotal in forming their alliances. Dahlerup (1988) has extended this notion to minorities in politics, arguing that the increased number of women in politics leads to attention to issues close to women's interests when the number of women reaches a "critical mass" threshold. Bratton (2005) applies this argument to a wide range of institutions and shows that women legislators in legislative assemblies with more women introduce more issues of women's interests than in legislative assemblies with less women. Therefore, I theorize that quotas could motivate non-quota women to introduce and enact more social policy issues than men elected to the quota tier do, which generates a gender effect.

Finally, I theorize that quotas may countervail a hindering effect on women's issues from male legislators electorally affected by quotas. A number of reasons may lead to such an effect. As the number of women increases in political arena—a historically male-dominated environment—the legislation of policies closer to women's interests is often under critical scrutiny (Lyn, Clarke, & Fox, 1991). Kanthak and Krause (2012) find that the increased legislative presence of women results in a devaluation of issues closer to women's concerns from elected men. For these reasons, I theorize that, in the face of increasing electoral competition, men elected to the quota tier could have particularly toned down women's issues as an adversarial reaction to quota policies. Instead, they may continue to introduce issues closer to men's interests (Schwindt-Bayer, 2006; Swers, 2002; Thomas, 1991). In addition to a quota-mandate and gender effect, my theoretical argument further extends to incorporate a quota-hindering effect, indicating that men elected to the quota tier are likely to propose welfare, health, and education bills at lower rates than men elected to the non-quota tier.

Quota Mechanism: The Macro-level Implications

In addition to a micro-level quota mechanism, I next theorize that the implications of gender quotas on social policymaking also exist on the macro country level. Studies have

argued that when the number of women increases in legislative assemblies, they are better able to advocate for issues such as social policies (Lyn et al., 1991; Saint-Germain, 1989; Thomas, 1991, 1994). For instance, Thomas (1991, 1994), based on the context of 12 state legislatures in the US, finds that in a state legislature with more women, social policy legislation, such as childcare and family policies, is better advocated. These findings raise a long-standing question in gender and politics, which is whether a critical mass exists for the effect of increased legislative presence of women on women's substantive representation on social policies. However, "human beings do not act automatically like particles" (Dahlerup, 1988). It is hardly convincing to conclude that a change in political agenda can be entirely ascribed to an increase in women's numeric representation.

Critiques of the critical mass argument document no evidence regarding such a threshold effect in gender and politics (Carroll, 2001; Cowley & Childs, 2003; Lovenduski, 2001; Studlar & McAllister, 2002). For instance, utilizing cross-sectional data in the context of 20 advanced industrial democracies over 50 years, Studlar and McAllister (2002) illustrate that women's increased substantive representation is not a function of a potential threshold value of women's numeric representation. Instead, they show that the relationship is rather incremental. Similarly, Carroll (2001) argues that a rise in party discipline might follow an increase in the legislative presence of women. Lovenduski (2001) and Cowley and Childs (2003) reveal that the increased number of women entering politics is associated with a higher level of party loyalty and less chances of women pursuing their own policy interests.

I argue that the debate revolving around the critical mass argument might derive from an underlying ground that these models do not account for additional mechanisms such as gender quotas. Theoretically, I propose to account for a quota mechanism as a driving factor in the macro relationship between the legislative presence of women and women's substantive representation on social policies. At the country level, and using data from a global sample, Clayton and Zetterberg (2018) provide an in-depth comparative analysis of the budgetary implications of gender quotas. They show that gender quotas have a positive effect on traditionally feminized social policy areas such as public health. In addition, I argue that

quota type matters for the quota effect on government spending. Among the three types of gender quotas, reserved seats—a legal quota that regulates the proportion/number of women elected—are often considered effective in increasing the number of women in legislatures when implemented accordingly (Paxton & Hughes, 2015; Schwindt-Bayer, 2009). In light of these, I theorize that quota policies are likely to influence health and education spending. Furthermore, I argue that reserved-seats have the strongest impact on social spending than any other quota type.

Chapter 4

Data and Units of Analysis

Papers 1—3 use various datasets with different units of analysis to examine the gendered origins and implications of social policies. In this section, I provide an overview of the datasets employed in the three papers in light of their units of analysis.

Paper 1 assesses the effects of an educational expansion on authoritarian support and patriarchal values by relying on individual people in an autocracy as the unit of analysis. To do so, I utilize the recent four waves of Chinese General Social Survey (CGSS), which were fielded in 2015, 2013, 2012, and 2010. To capture the decentralization of the educational expansion, individuals' province of origin from the survey is matched to provincial university intensity retrieved from China's Statistical Yearbook. CGSS provides nationally representative samples and has been widely used by political scientists (Jiang & Yang, 2016; Mattingly, 2016). Primary sampling units of CGSS were selected that relied on the census. The sampling design corresponds to a five-stage stratified approach with probabilities of selection proportional to size in all stages. Stratified multistage sampling was employed to target the adult population (above 18) (Ji & Jiang, 2019). All of the CGSS surveys were conducted in face-to-face interviews by professional survey teams. The CGSS surveys participate in the International Social Survey Program and are run by researchers from the Hong Kong University of Science and Technology and Renmin University of China (Jiang & Yang, 2016; Mattingly, 2016). Each wave of CGSS interviewed more than 10,000 individuals in 28 provinces. While the CGSS surveys are designed to be representative (Jiang &

Yang, 2016; Mattingly, 2016), one crucial concern is the reliability of the survey responses in an autocracy. Studies have revealed no evidence of the Chinese government attempting to interfere with the CGSS survey responses (Ji & Jiang, 2019; Jiang & Yang, 2016; Mattingly, 2016). The local government was not involved in any survey collection process, and interviewers were recruited by the CGSS team and went through extensive training before survey fielding (Jiang & Yang, 2016). Moreover, the team also recruited experienced interviewers to check for irregularities in the interview process and completion (Jiang & Yang, 2016). I provide details of the survey questions and codebook in Paper 1, Appendix 2.

Subsequently, Paper 2 investigates the relationship between quota implementation and social policy legislation relying on individual legislators in a new democracy as the unit of analysis. I compiled an original dataset coded from Taiwan's legislative records. The dataset covers the time period 1999-2008, across six legislative terms. Detailed information is included at the level of each legislator on their legislative behavior from bill introduction to passage, as well as their individual characteristics (party identification, majority party, seniority, age, education, and committee membership). The last two sessions of the ninth legislature were excluded from the dataset because these sessions were still ongoing at the time of data collection. Notably, the last legislative session of each year often extends two weeks into the next year. To avoid serial correlation—legislative behavior at the start of the year is explained by the behavior of the previous year—bills in the first two weeks of each year were coded as bills of the previous year. Legislators who served as president or vice president of the legislature are excluded, because they typically introduce very few bills. Following previous research on gender and bill sponsorship (Volden et al., 2018), health, welfare, and education bills were operationalized based on the coding classification by Baumgartner and Jones (2002). Detailed accounts regarding subcategories for each issue are provided in Paper 2, appendices S.2 and S.3.

Finally, Paper 3 examines the origins of and implications of gender quotas and the legislative presence of women on health and education spending worldwide at the level of individual countries. An original panel dataset was compiled covering 153 countries from

2000 to 2016. Countries with populations less than one million were excluded due to missing data on important indicators.[7] Countries without legislatures in a given year were also excluded.[8] I focus on the post-2000 period because this period saw a large global increase in quota implementation.

The adoption and implementation of gender quotas were operationalized binarily based on the Global Database of Gender Quota and Quota Adoption and Reform Over Time (QAROT) by Hughes et al. (2017). In most cases, quotas were implemented after adoption from the next election cycle. In other cases (e.g., Armenia and Uruguay), it took much longer to implement the quota. Moreover, some quotas were never enforced (e.g., Brazil and Cameroon). For these reasons, I examine both quota adoption and implementation. In total, there are 11 cases in my sample where quotas were not implemented in the next electoral cycle.[9] Quota implementation for each type of gender quota was coded as one of the following: reserved-seats, voluntary party quota, or candidate list quota. Following Bush (2011), the implementation of voluntary political party quotas was coded by excluding the cases where parties were too small or too dominant. Specifically, cases were only included if one or more parties that implemented a quota reached more than 30% of the legislature's seats in a given year. This coding process is meaningful because the use of voluntary party quotas by small parties is more symbolic than impactful. Similarly, the cases of quota implementation by a dominant party in a noncompetitive electoral system were excluded and counted as reserved seats.[10]

Health and education spending data were constructed using global expenditure data from the World Development Indicators (WDI). I focus on health and education spending

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[7]These small countries include Antigua and Barbuda, Belize, Cape Verde, Djibouti, Dominica, Kiribati, Liechtenstein, Maldives, Malta, Marshall Islands, Micronesia, Monaco, Montenegro, Samoa, São Tomé and Príncipe, San Marino, Seychelles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Tonga, Tuvalu, and Vanuatu.

[8]The countries that have missing data or have experienced coups or civil wars during the period include Afghanistan, Bosnia and Herzegovina, Eritrea, Sierra Leone, Somalia, Somaliland, United Arab Emirates, and Zanzibar.

[9]These cases included Armenia, Brazil, Cameroon, Colombia, DR Congo, Republic of the Congo, Côte d'Ivoire, Eswatini, Guinea, Haiti, and Liberia.

[10]For instance, these cases include Burkina Faso's Congress for Democracy and Progress before 2014.

instead of other social spending because information on global health and education spending are available worldwide. I use the variables of women's political rights and international development assistance to explain the implementation of gender quotas. Women's political rights were measured using 4-point Cingranelli-Richards (CIRI) scale scores retrieved from the dataset developed by Cingranelli et al. (2018). International development assistance was coded as the lagged value of net official development assistance as percentage of GDP using data from WDI. Moreover, this paper draws on a set of economic, political, and demographic controls. The control variables were coded using information from various datasets, including WDI, Polity IV data, Database of Political Institutions (Cruz, Keefer, & Scartascini, 2018), USAID data, Freedom House, UN peacekeeping data, and Varieties of Democracy (V-Dem). Details regarding data collection from multiple datasets are described in Paper 3, Appendix 1.

Chapter 5

Methodological Considerations

This section presents methodological issues and estimation techniques employed in Papers 1—3 that are worthy of particular attention. More specifically, it addresses methodological problems concerning the use of non-random observational data, threats to causal identification, and common assumptions. Further, it discusses the validity and robustness tests of the relevant selected models.

Causal Identification

This thesis combines regression-based analyses with a design-based approach. It draws on various causal mechanisms for clear argumentation. As Gerring (2011, p.217) noted, "an X/Y hypothesis without a clear causal mechanism is difficult to generalize upon and prove in a convincing fashion." While the selected cases of policy interventions might produce assignment to a treatment, as-if randomized, empirical modeling relies on observational data, where treatments are not randomized. As such, causal identification strategies similar to natural experiments often require careful explanation from the threats of confounding factors and selection bias (Keele, 2015). Notably, this is not to insinuate that causal inferences are impossible using observational data. With a clear explanation of the causal mechanism, a quasi-experimental design-based approach could allow inferring X is a cause of Y by inferring from what Y would counterfactually be without X. This thesis focuses on this kind of counterfactual understanding of causal inference.

At the core of the counterfactual model of causality is the potential outcomes framework (Rubin, 2005), which assumes that each subject has a potential outcome under both treatment and control states: Y_{it}^1 and Y_{it}^0. Evidently, each subject can only be observed in either treatment or control state at any point in time. The difference between a subject's potential outcome under the treatment state and the potential outcome under the control state, therefore, can never be observed. This problem of unobservability is referred to as the "fundamental problem of causal inference" (Holland, 1986). Due to this unobservability, in the potential outcome framework, attention is given to estimating the "naive" estimate of the average treatment effect, often summarized as the difference between expected values under the treatment and control states: $E(Y_{it}^1 \mid D = 1) - E(Y_{it}^0 \mid D = 0)$ (Dunning, 2012; Morgan & Winship, 2015). In observational studies, simply comparing the subjects under the treatment and the control state cannot yield any meaningful results because the treatment and control groups most likely differ in many aspects. Conditioning is needed to introduce a set of covariates into analyses. Relevantly, the conditional independence assumption of causal inference assumes that treatment (D) is independent of potential outcome (Y) when all the relevant factors on which the treatment and control groups differ are accounted for in the analyses. Under such assumption, selection bias and omitted variable bias are likely to arise. Subsequently, I discuss these threats to causal identification and the approach this thesis takes to address them.

Addressing Threats to Causal Identification

Papers 1–3 make conscious decisions regarding choice of models, logarithmic transformation of variables, inclusion of controls, cluster of standard errors, and corresponding robustness tests to examine the validity of findings. Detailed methodological concerns are discussed and addressed in each individual paper. Below, I address the common threats to causal identification throughout the thesis, including discussion on addressing selection bias, reverse causality, and omitted variable bias.

Endogenous selection bias occurs when the cases or subjects select themselves into a

particular category: for instance, the treatment or control state (Hug, 2003). The common approach to capture self-selection bias includes adding covariates to selection into treatment and to the outcome. In addition to this common approach, in Paper 1, I consider that self-selection might arise in both temporal and spatial dimensions of the treatment variable—access to higher education. Temporally, some students might strategically enter college one year later to benefit from large-scale educational expansion. Spatially, it is likely that students might strategically relocate to a province with better educational resources to increase their chances of getting into a university. To address temporal self-selection, I present robustness tests using age 19 as an expansion threshold for defining the younger cohort. Using 19 as a threshold, the findings remained almost unchanged, suggesting that endogenous selection bias is not likely to drive the results. As for spatial self-selection, I recoded survey respondents' province of origin to account for recent relocation. I restricted the sample excluding respondents with recent relocation. By doing so, I took a pragmatic approach to reduce the occurrence of self-selection.

Paper 2 investigates the effects of quota implementation on legislative initiation and the passage of social policy bills. Here, omitted variable bias might arise when certain unobserved individual characteristics affect the probability of becoming quota legislators, and neglecting these factors would result in biased estimates. Another concern relates to reverse causality. Reverse causality might arise when legislators active in advancing stereotypical women's issues are allocated the quota status. Moreover, quota implementation may result from women's increased substantive representation in legislative assemblies. Hence, the causal direction may go both ways. As a robustness test to address both omitted variable bias and reverse causality, I draw on entropy balancing with fixed effects for instrumental variable analysis (2SLS-IV).[11] The coefficients remained unchanged upon additional testing, suggesting that the findings hold up to further scrutiny under the potential threat of bias.

Paper 3 investigates the effects of quota implementation and the legislative presence of women on health and education spending at the global level. Similarly, as with observational

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[11]Entropy balancing is a method developed by Hainmueller (2012). It is employed in observational studies to balance out all covariates.

data, omitted variable bias might be a concern if unobserved country-level factors affect both quota implementation and spending. To address this issue and avoid omitted variable bias, year- and country-fixed effects were added for the estimation of all the relevant models. By doing so, I rule out the possibility that unobserved country-specific time-invariant traits or time-specific factors influence the outcome (Halaby, 2004) and increase confidence that the findings are not entirely driven by omitted variable bias.

Addressing Common Assumptions

Papers 1 and 2 commonly use the two-stage least-squares instrumental variable (2SLS-IV) approach. More specifically, Paper 1 uses IV estimation to investigate the effect of educational expansion on attitudinal change, with an interaction between age cohort and university intensity as an instrument influencing the probability of higher education (treatment variable). Paper 2 uses a similar approach to investigate the effect of gender quotas on the passage of social policy legislation, with quotas as the instrument related to initiating social policy legislation (treatment variable). Importantly, this identification strategy makes certain assumptions about the identifying process. In the following, I address some of these common assumptions.

Figure 5: Instrumental Variable Illustration
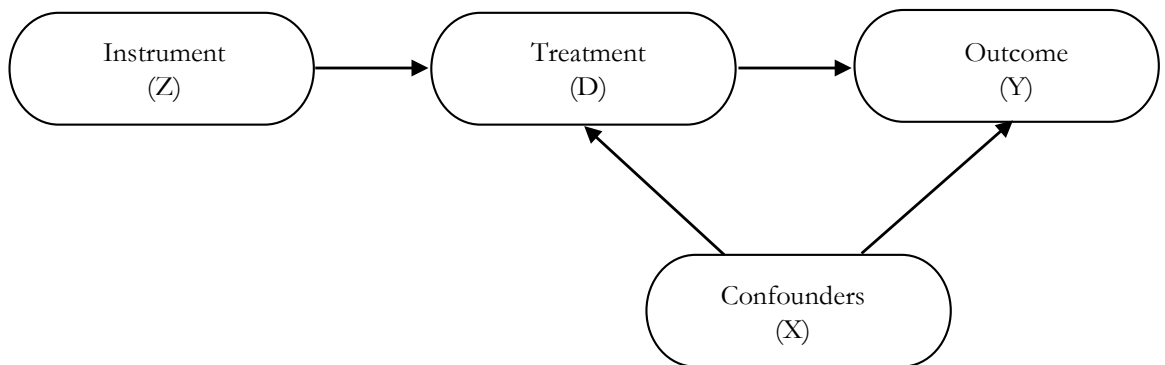
Figure 5 illustrates the IV approach. The basic notion of IV is to split the variation of treatment (D) into two components: the component that is related to confounders (X),

and the exogenous component that is related to the instrument (Z). In a potential outcome framework, there are three main assumptions for an instrument to be valid. The first assumption concerns a strong instrument. In order for the instrument to generate variation in the treatment, the instrument needs to be strongly related to the treatment variable. This thesis addresses this issue by reporting the Kleibergen-Paap F statistic. With F statistics well above 10 in all IV analyses, the null hypothesis of weak instrument can be rejected. This means that an interaction between age cohort and university intensity is strongly related to higher education (Paper 1). Similarly, status as quota legislators creates a variation in initiating social policy legislation (Paper 2).

The second assumption is the independence assumption, denoting that the instrument needs to be uncorrelated with the error term. Put differently, the instrument should preferably generate as-if randomization and not be correlated with the unmeasured causes of the outcome. To address this issue, I include relevant controls in the IV model specification throughout the thesis. Finally, the exclusion restriction assumption must be held. Exclusion restriction holds that the only effect the instrument has on the outcome variable should go through the treatment, which is probably the most critical condition among the three assumptions. This suggests that the instrument should not influence the outcome directly or through other variables, and the backdoor paths must be blocked/conditioned (J. Angrist & Imbens, 1994; Morgan & Winship, 2015; Sovey & Green, 2011). In Paper 2, because the legislator must initiate a bill first for it to be passed, this assumption is particularly valid for situations where the instrument should not influence the outcome by bypassing the endogenous treatment variable. As for situations in which the instrument should not affect the outcome through other variables, I conditioned on the possible backdoor channels: social policy committee membership and majority party membership (Kerevel & Atkeson, 2013; Schwindt-Bayer, 2006). Conditioning on these channels should block the backdoor channels and increase estimation confidence.

Chapter 6

Concluding Remarks

and Potential Extensions

Summary of Findings

What are the gendered origins and outcomes of social policies in the developing world? This thesis offers a new gendered approach to the study of social policies. The findings shed light on a number of competing arguments in the previous literature. In sum, the research contributes to our understanding of gender and social policies in three ways.

First, Paper 1 investigates the effect of educational expansion as a large-scale social policy implementation on authoritarian support and patriarchal values in an autocracy. While proponents of modernization theories argue that education decreases both support for authoritarianism and authoritarian patriarchy, my findings show that higher education expansion as a social policy program is no silver bullet for autocrats to maintain all dimensions of authoritarian values. The findings reveal that social policy is unlikely to weaken deeply ingrained authoritarian support; however, it can substantially decline the prevalence of authoritarian patriarchal values[12]. Further, when the types of authoritarian support are differentiated, higher education expansion decreases specific authoritarian support (immediate policy response), whereas it does not affect diffuse authoritarian support (long-term

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[12]The result is particularly supported in less urbanized regions.

entrenched authoritarian values).

Second, moving from an autocracy to a new democracy, Paper 2 conducts an in-depth examination of the quota effect on women's substantive representation on social policies. Using various identification strategies, my findings show that the quota effect on social policymaking hinges on gender and the way legislators are elected. In the legislative initiative stage, quotas have the strongest impact on quota women, effectively translating their social policy priorities (welfare and health issues) into agenda-setting. Although past studies have well documented the gender effect on women's substantive representation—women often have common policy pursuits (Franceschet & Piscopo, 2008; Rosenthal, 1998)—this study reveals that quotas do not generate a related effect on social policy legislation for non-quota women during the legislative initiative stage. In the legislative outcome stage, in contrast, quotas expand opportunities for both quota and non-quota women to enact social policy priorities. Early literature argues that as the number of women in legislature increases, the elected men affected by quotas might generate adversarial reactions to advance policies that are stereotypically women's issues. However, I find that quota introduction also has a sizable effect on men elected to the quota tier, making them more likely to initiate health issue legislation than men elected to the non-quota tier.

Finally, Paper 3 shifts the focus to the macro level and explores the factors explaining quota diffusion and the effect of quotas on social policy spending across 153 countries. This study explores an under-studied explanation of quota origins. It shows that international development assistance moderates the relationship between women's political rights and quota implementation. Specifically, international development assistance has an increasingly positive effect on quota implementation. By applying fixed-effects analyses, I find that the increased legislative presence of women is significantly associated with a small increase in health spending. I also examine the effects of quota implementation and adoption on social policy spending. As a result, I find that quota implementation, rather than adoption, significantly leads to more health spending. This effect is particularly strong for the implementation of reserved-seat quotas. These findings are largely in support of the

macro origins and implications of a quota mechanism previously illustrated in the section of theoretical arguments.

Implications of Findings and Future Research

While much of the literature on gender and social policies has focused on the developed world, these findings reveal that the gendered origins and implications of social policies largely exist in the developing world. The presented findings provide a nuanced account of the relationships between gender and social policies in various ways.

First, gender quotas do not always increase women's substantive representation in social policies. The literature on gender and politics tends to underscore the importance of a critical mass effect—that gender quotas and the increased proportion of women in politics lead to greater attention to policies that women care about (Barnes, 2012; Bratton, 2005; Dahlerup, 1988; Kanter, 1977). This research suggests that this is only one side of the story: The quota effect on social policies depends on different levels of analysis. On the macro level, quota implementation leads to a significant increase in heath spending. However, on a more micro level, based on the context of a new democracy, when accounting for formalisitic representation (the way women are elected) and distinguishing among different types of legislators, the critical mass argument only holds for quota women: The quota implementation increases the probability of quota women initiating more health and education issues than any other legislators. In comparison, the related quota effect cannot be observed for non-quota women.[13] By unbundling such a quota mechanism, I initiate a reappraisal of the critical mass argument and challenge the common assumption that women often represent women.

Second, the findings add important insights that gender quotas drive social policymaking through micro- and macro-level mechanisms in different ways. On the macro level, quota implementation results in a significant global increase in health spending and no effect on

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[13]This finding derives from comparing the legislative behavior of non-quota women with men elected to the non-quota tier.

education spending. In contrast, on the micro level, based on legislative behavior in a new democracy, there is no quota effect on legislative initiation of health bills. However, based on the same context, there is a significant and positive quota effect on legislative initiation of education and welfare bills. In short, based on different levels of analysis, the quota effect can diverge for different social policy outcomes.

Third, contrary to the notion that social policies can be strategically utilized to generate authoritarian values (Acemoglu & Robinson, 2005; Boix, 2003; De Mesquita Bruce et al., 2003), I find evidence that while higher education expansion cannot affect diffuse authoritarian support (entrenched authoritarian traits), it can substantially decline specific authoritarian support (immediate policy response) and patriarchal authoritarian values.

Moving forward, the findings uncovered in this thesis suggest venues for future research. These findings raise the question of whether and when women represent women—a process translating women's descriptive representation into their substantive representation regarding women's interests. Future work on gender and social policies could go beyond the focus on social policies and delve into other policy areas. This way, it could provide a comprehensive picture of what other issues women care about if they do not represent what are categorized as traditionally "women's interests." Future research could further investigate what other spending areas are offset by a simultaneous increase in health spending. This could help identify how and why different types of government spending are prioritized or deprioritized following quota implementation, and further explore the broader budgetary implications of gender quotas.

Finally, a focus on gender quotas and social policy expansion in electoral authoritarian regimes would merit particular attention. A majority of gender quotas were implemented in the developing world, particularly in autocracies. But what does it mean to increase women's legislative representation in authoritarian contexts where politicians regardless of gender generally cannot influence politics? How does authoritarian quota implementation increase women's substantive representation on social policies? Does the implementation serve strategic purposes to co-opt women for domestic power consolidation and boosting

regime legitimacy internationally? Or is quota implementation in these contexts more likely to be ineffective and serve as a symbolic top-down imposition? Initiating a critical assessment of authoritarian gender equality might help us understand these puzzling mechanisms underlying gender quotas and social policies in rather large parts of the world.

References

Acemoglu, D. (1996). A microfoundation for social increasing returns in human capital accumulation. *The Quarterly Journal of Economics*, *111*(3), 779–804.

Acemoglu, D., & Robinson, J. A. (2005). *Economic origins of dictatorship and democracy*. London: Cambridge University Press.

Adcock, R., & Collier, D. (2001). Measurement validity: A shared standard for qualitative and quantitative research. *American Political Science Review*, *95*(3), 529–546.

Adorno, T., Frenkel-Brenswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The Authoritarian personality*. New York: Harper.

Agerberg, M., & Kreft, A.-K. (2020). Gendered conflict, gendered outcomes: The politicization of sexual violence and quota adoption. *Journal of Conflict Resolution*, *64*(2-3), 290–317.

Altemeyer, B. (1981). *Right-wing authoritarianism*. Winnipeg: University of Manitoba Press.

Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*. San Francisco: Jossey-Bass.

Altemeyer, B. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.

Angrist, J., & Imbens, G. (1994). Identification and estimation of local average treatment effects. *Econometrica*, *62*(2), 467–475.

Angrist, J. D., & Keueger, A. B. (1991). Does compulsory school attendance affect schooling and earnings? *The Quarterly Journal of Economics*, *106*(4), 979–1014.

Barnes, T. D. (2012). Gender and legislative preferences: Evidence from the Argentine

provinces. *Politics & Gender*, *8*(4), 483–507.

Baumgartner, F. R., & Jones, B. D. (2002). *Policy dynamics*. Chicago: University of Chicago Press.

Becker, R. (2003). Educational expansion and persistent inequalities of education: Utilizing subjective expected utility theory to explain increasing participation rates in upper secondary school in the Federal Republic of Germany. *European Sociological Review*, *19*(1), 1–24.

Boix, C. (2003). *Democracy and redistribution*. London: Cambridge University Press.

Bratton, K. A. (2005). Critical mass theory revisited: The behavior and success of token women in state legislatures. *Politics & Gender*, *1*(1), 97–125.

Bratton, K. A., & Ray, L. P. (2002). Descriptive representation, policy outcomes, and municipal day-care coverage in Norway. *American Journal of Political Science*, *46*(2), 428–437.

Breen, R., & Jonsson, J. O. (2007). Explaining change in social fluidity: Educational equalization and educational expansion in twentieth-century Sweden. *American Journal of Sociology*, *112*(6), 1775–1810.

Bush, S. S. (2011). International politics and the spread of quotas for women in legislatures. *International Organization*, *65*(1), 103–137.

Card, D. (2001). Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica*, *69*(5), 1127–1160.

Carroll, S. J. (2001). *The impact of women in public office*. Bloomington: Indiana University Press.

Celis, K., Childs, S., Kantola, J., & Krook, M. L. (2008). Rethinking women's substantive representation. *Representation*, *44*(2), 99–110.

Chattopadhyay, R., & Duflo, E. (2004). Women as policy makers: Evidence from a randomized policy experiment in india. *Econometrica*, *72*(5), 1409–1443.

Childs, S. (2004). *New labour's woman MPs*. New York: Routledge.

Childs, S., & Krook, M. L. (2012). Labels and mandates in the United Kingdom. In

S. Franceschet, M. L. Krook, & J. M. Piscopo (Eds.), *The impact of gender quotas* (pp. 89–102). New York: Oxford University Press.

Ciftci, S. (2010). Modernization, Islam, or social capital: What explains attitudes toward democracy in the Muslim world? *Comparative Political Studies*, *43*(11), 1442–1470.

Cingranelli, D., Filippov, M., & Mark, S. (2018). *Cirights dataset.* The Binghamton University Human Right Institute.

Clayton, A., Josefsson, C., Mattes, R., & Mozaffar, S. (2019). In whose interest? Gender and mass–elite priority congruence in Sub-Saharan Africa. *Comparative Political Studies*, *52*(1), 69–101.

Clayton, A., Josefsson, C., & Wang, V. (2017). Quotas and women's substantive representation: Evidence from a content analysis of ugandan plenary debates. *Politics & Gender*, *13*(2), 276–304.

Clayton, A., & Zetterberg, P. (2018). Quota shocks: Electoral gender quotas and government spending priorities worldwide. *The Journal of Politics*, *80*(3), 916–932.

Clots-Figueras, I. (2012). Are female leaders good for education? Evidence from India. *American Economic Journal: Applied Economics*, *4*(1), 212–44.

Cowley, P., & Childs, S. (2003). Too spineless to rebel? New labour's women MPs. *British Journal of Political Science*, *33*(3), 345–365.

Cruz, C., Keefer, P., & Scartascini, C. (2018). *Database of political institutions 2017.* Washington, DC: Inter-American Development Bank.

Dahlerup, D. (1988). From a small to a large minority: Women in Scandinavian politics. *Scandinavian Political Studies*, *11*(4), 275–298.

De La O, A. L. (2013). Do conditional cash transfers affect electoral behavior? Evidence from a randomized experiment in Mexico. *American Journal of Political Science*, *57*(1), 1–14.

De Mesquita Bruce, B., Smith, A., Siverson, R. M., & Morrow, J. D. (2003). *The logic of political survival.* Cambridge, MA: MIT Press.

Donno, D., & Kreft, A.-K. (2019). Authoritarian institutions and women's rights. *Compar-*

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ative Political Studies, *52*(5), 720–753.

Duckitt, J., & Bizumic, B. (2013). Multidimensionality of right-wing authoritarian attitudes: Authoritarianism-conservatism-traditionalism. *Political Psychology*, *34*(6), 841–862.

Duflo, E. (2004). The medium run effects of educational expansion: Evidence from a large school construction program in Indonesia. *Journal of Development Economics*, *74*(1), 163–197.

Duncan, L. E., Peterson, B. E., & Winter, D. G. (1997). Authoritarianism and gender roles: Toward a psychological analysis of hegemonic relationships. *Personality and Social Psychology Bulletin*, *23*(1), 41–49.

Dunning, T. (2008). *Crude democracy: Natural resource wealth and political regimes.* Cambridge: Cambridge University Press.

Dunning, T. (2012). *Natural experiments in the social sciences: A design-based approach.* Cambridge: Cambridge University Press.

Easton, D. (1965). *A system analysis of political life.* New York: John Wiley.

Easton, D. (1975). A re-assessment of the concept of political support. *British Journal of Political Science*, *5*(4), 435–457.

Ennser-Jedenastik, L. (2017). Campaigning on the welfare state: The impact of gender and gender diversity. *Journal of European Social Policy*, *27*(3), 215–228.

Falleti, T. G. (2009). Infiltrating the state: The evolution of health care reforms in Brazil, 1964–88. In J. Mahoney & K. Thelen (Eds.), *Explaining institutional change: Ambiguity, agency, and power* (pp. 38–62). Cambridge: Cambridge University Press.

Feldman, S. (2003). Enforcing social conformity: A theory of authoritarianism. *Political Psychology*, *24*(1), 41–74.

Feldman, S., & Stenner, K. (1997). Perceived threat and authoritarianism. *Political Psychology*, *18*(4), 741–770.

Finkel, S. E., Pérez-Liñán, A., & Seligson, M. A. (2007). The effects of US foreign assistance on democracy building, 1990–2003. *World Politics*, *59*(3), 404–439.

Fleckenstein, T., & Lee, S. C. (2014). The politics of postindustrial social policy: Family

policy reforms in Britain, Germany, South Korea, and Sweden. *Comparative Political Studies*, *47*(4), 601–630.

Franceschet, S., & Piscopo, J. M. (2008). Gender quotas and women's substantive representation: Lessons from Argentina. *Politics & Gender*, *4*(3), 393–425.

Frenkel-Brunswik, E. (1952). Interaction of psychological and sociological factors in political behavior. *American Political Science Review*, *46*(1), 44–65.

Gerring, J. (2011). *Social science methodology: A unified framework*. Cambridge: Cambridge University Press.

Glaeser, E. L., Ponzetto, G. A., & Shleifer, A. (2007). Why does democracy need education? *Journal of Economic Growth*, *12*(2), 77–99.

Haber, S., Maurer, N., & Razo, A. (2003). *The politics of property rights: Political instability, credible commitments, and economic growth in Mexico, 1876-1929*. Cambridge: Cambridge University Press.

Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, *20*(1), 25–46.

Halaby, C. N. (2004). Panel models in sociological research: Theory into practice. *Annual Review of Sociology*, *30*, 507–544.

Hannum, E., & Buchmann, C. (2005). Global educational expansion and socio-economic development: An assessment of findings from the social sciences. *World Development*, *33*(3), 333–354.

Harding, R., & Stasavage, D. (2013). What democracy does (and doesn't do) for basic services: School fees, school inputs, and African elections. *The Journal of Politics*, *76*(1), 229–245.

Holland, P. W. (1986). Statistics and causal inference. *Journal of the American statistical Association*, *81*(396), 945–960.

Hug, S. (2003). Selection bias in comparative research: The case of incomplete data sets. *Political Analysis*, 255–274.

Hughes, M. M., Paxton, P., Clayton, A., & Zetterberg, P. (2017). Quota adoption and reform over time (qarot), 1947-2015.

Hughes, M. M., & Tripp, A. M. (2015). Civil war and trajectories of change in women's political representation in africa, 1985–2010. *Social forces*, *93*(4), 1513–1540.

Inglehart, R. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies.* Princeton: Princeton University Press.

Inglehart, R., & Norris, P. (2003). *Rising tide: Gender equality and cultural change around the world.* Cambridge: Cambridge University Press.

Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy: The human development sequence.* London: Cambridge University Press.

Inglehart, R., & Welzel, C. (2010). Changing mass priorities: The link between modernization and democracy. *Perspectives on Politics*, *8*(2), 551–567.

Iversen, T., Rosenbluth, F. M., & Rosenbluth, F. (2010). *Women, work, and politics: The political economy of gender inequality.* New Haven: Yale University Press.

Jacob, P. E. (1957). *Changing values in college: An exploratory study of the impact of college teaching.* New York: Harper & Row.

Ji, C., & Jiang, J. (2019). Enlightened one-party rule? Ideological differences between Chinese Communist Party members and the mass public. *Political Research Quarterly*, 1065912919850342.

Jiang, J., & Yang, D. L. (2016). Lying or believing? Measuring preference falsification from a political purge in China. *Comparative Political Studies*, *49*(5), 600–634.

Kanter, R. M. (1977). *Men and women of the corporation.* New York: Basic Books.

Kanthak, K., & Krause, G. A. (2012). *The diversity paradox: Political parties, legislatures, and the organizational foundations of representation in America.* New York : Oxford University Press.

Keele, L. (2015). The statistics of causal inference: A view from political methodology. *Political Analysis*, 313–335.

Kerevel, Y. P., & Atkeson, L. R. (2013). Explaining the marginalization of women in

legislative institutions. *The Journal of Politics*, *75*(4), 980–992.

Knutsen, C. H., & Rasmussen, M. (2018). The autocratic welfare State: Old-age pensions, credible commitments, and regime survival. *Comparative Political Studies*, *51*(5), 659–695.

Krook, M. L. (2013). Gender quotas and democracy: Insights from africa and beyond. In *Women's studies international forum* (Vol. 41, pp. 160–163).

Lewis, J. (1992). Gender and the development of welfare regimes. *Journal of European Social policy*, *2*(3), 159–173.

Lijphart, A., Aitkin, D., et al. (1994). *Electoral systems and party systems: A study of twenty-seven democracies, 1945-1990.* Oxford: Oxford University Press.

Lipset, S. M. (1959). Some social requisites of democracy: Economic development and political legitimacy. *American Political Science Review*, *53*(1), 69–105.

Lipset, S. M. (1960). *Political man: The social basis of modern politics.* New York: Doubleday.

Lovenduski, J. (1998). Gendering research in political science. *Annual Review of Political Science*, *1*(1), 333–356.

Lovenduski, J. (2001). Women and politics: Minority representation or critical mass? *Parliamentary Affairs*, *54*(4), 743–758.

Lü, X. (2014). Social policy and regime legitimacy: The effects of education reform in China. *American Political Science Review*, *108*(2), 423–437.

Lyn, K., Clarke, E., Susan, & Fox, A., Barbara. (1991). Ways women politicians are making a difference. In D. L. Dodson (Ed.), *Gender and policymaking: Studies of women in office.* New Brunswick: Center for the American Woman and Politics, Eagleton Institute of Politics.

Mandel, H., & Semyonov, M. (2006). A welfare state paradox: State interventions and women's employment opportunities in 22 countries. *American Journal of Sociology*, *111*(6), 1910–1949.

Mares, I., & Carnes, M. E. (2009). Social policy in developing countries. *Annual Review of*

Political Science, *12*, 93–113.

Mattingly, D. C. (2016). Elite capture: How decentralization and informal institutions weaken property rights in China. *World Politics*, *68*(3), 383–412.

McKay, A. (2001). Rethinking work and income maintenance policy: Promoting gender equality through a citizens' basic income. *Feminist Economics*, *7*(1), 97–118.

Miller, A. H., Hesli, V. L., & Reisinger, W. M. (1994). Reassessing mass support for political and economic change in the former USSR. *American Political Science Review*, *88*(2), 399–411.

Moretti, E. (2004). Workers' education, spillovers, and productivity: Evidence from plant-level production functions. *American Economic Review*, *94*(3), 656–690.

Morgan, S. L., & Winship, C. (2015). *Counterfactuals and causal inference.* Cambridge: Cambridge University Press.

Morrisson, C., & Jütting, J. P. (2005). Women's discrimination in developing countries: A new dataset for better policies. *World Development*, *33*(7), 1065–1081.

Paxton, P., & Hughes, M. M. (2015). The increasing effectiveness of national gender quotas, 1990–2010. *Legislative Studies Quarterly*, *40*(3), 331–362.

Peterson, P. E., & Rom, M. (1989). American federalism, welfare policy, and residential choices. *American Political Science Review*, *83*(3), 711–728.

Phillips, A. (1995). *The politics of presence.* New York: Oxford University Press.

Pitkin, H. F. (1967). *The concept of representation.* Berkeley: University of California Press.

Quinley, H. E., & Glock, C. Y. (1979). *Anti-semitism in America.* New York: Free Press.

Rosenthal, C. S. (1998). *When women lead: Integrative leadership in state legislatures.* New York : Oxford University Press.

Rubin, D. B. (2005). Causal inference using potential outcomes: Design, modeling, decisions. *Journal of the American Statistical Association*, *100*(469), 322–331.

Sainsbury, D., et al. (1999). *Gender and welfare state regimes.* Oxford: Oxford University Press.

Saint-Germain, M. A. (1989). Does their difference make a difference? The impact of women on public policy in Arizona legislature. *Social Science Quarterly*, *70*(12), 956–68.

Sanborn, H., & Thyne, C. L. (2014). Learning democracy: Education and the fall of authoritarian regimes. *British Journal of Political Science*, *44*(4), 773–797.

Schwindt-Bayer, L. A. (2006). Still supermadres? Gender and the policy priorities of Latin American legislators. *American Journal of Political Science*, *50*(3), 570–585.

Schwindt-Bayer, L. A. (2009). Making quotas work: The effect of gender quota laws on the election of women. *Legislative Studies Quarterly*, *34*(1), 5–28.

Schwindt-Bayer, L. A., & Mishler, W. (2005). An integrated model of women's representation. *The Journal of Politics*, *67*(2), 407–428.

Seawright, J., & Gerring, J. (2008). Case selection techniques in case study research. *Political Research Quarterly*, *61*, 294–308.

Singer, J. D. (1961). The level-of-analysis problem in international relations. *World Politics*, *14*(1), 77–92.

Sovey, A. J., & Green, D. P. (2011). Instrumental variables estimation in political science: A readers' guide. *American Journal of Political Science*, *55*(1), 188–200.

Stubager, R. (2008). Education effects on authoritarian–libertarian values: A question of socialization. *The British Journal of Sociology*, *59*(2), 327–350.

Studlar, D. T., & McAllister, I. (2002). Does a critical mass exist? A comparative analysis of women's legislative representation since 1950. *European Journal of Political Research*, *41*(2), 233–253.

Sullivan, J. L., Piereson, J., & Marcus, G. E. (1982). *Political tolerance and American democracy*. Chicago: University of Chicago Press.

Suziedelis, A., & Lorr, M. (1973). Conservative attitudes and authoritarian values. *The Journal of Psychology*, *83*(2), 287–294.

Swers, M. L. (2002). *The difference women make: The policy impact of women in congress*. Chicago: University of Chicago Press.

Swers, M. L. (2005). Connecting descriptive and substantive representation: An analysis

of sex differences in cosponsorship activity. *Legislative Studies Quarterly*, *30*(3), 407–433.

Thomas, S. (1991). The impact of women on state legislative policies. *The Journal of Politics*, *53*(4), 958–976.

Thomas, S. (1994). *How women legislate*. Oxford: Oxford University Press.

Thun, E. (2004). Keeping up with the Jones': Decentralization, policy imitation, and industrial development in China. *World Development*, *32*(8), 1289–1308.

Tripp, A. M., & Kang, A. (2008). The global impact of quotas: On the fast track to increased female legislative representation. *Comparative Political Studies*, *41*(3), 338–361.

Volden, C., Wiseman, A. E., & Wittmer, D. E. (2018). Women's issues and their fates in the US congress. *Political Science Research and Methods*, *6*(4), 679–696.

Wängnerud, L. (2009). Women in parliaments: Descriptive and substantive representation. *Annual Review of Political Science*(12), 51–69.

Waylen, G. (1994). Women and democratization conceptualizing gender relations in transition politics. *World Politics*, *46*(3), 327–354.

Weil, F. D. (1985). The variable effects of education on liberal attitudes: A comparative-historical analysis of anti-semitism using public opinion survey data. *American Sociological Review*, 458–474.

Whitley Jr, B. E. (1999). Right-wing authoritarianism, social dominance orientation, and prejudice. *Journal of Personality and Social Psychology*, *77*(1), 126.

Paper 1

Gender Equality without Democracy? Evidence from a Large-Scale Higher Education Expansion in China

Gender Equality without Democracy? Evidence from a Large-Scale Higher Education Expansion in China*

Suen Wang

Abstract

How does social policy affect attitudes? Leveraging exogenous variation, I evaluate how higher education expansion in China has affected authoritarian support and authoritarian patriarchal values. I combine spatial differences in the number of university enrollments with temporal differences across cohorts derived from the timing of the expansion by using ordered logistic models and an instrumental variable approach to assess four waves of Chinese national representative surveys coupled with regional statistics data. I find that social policy has resulted in diminished authoritarian support when the support refers to immediate response (specific support); however, it has not influenced long-term authoritarian traits (diffuse support). Moreover, higher education expansion has led to a significant decrease in authoritarian patriarchal values, particularly in less urbanized regions. These results suggest that transformation to more liberal gender values is not always coupled with a decrease in authoritarian support. The findings have broader implications for understanding the effects of social policy programs on authoritarian attitudes in a non-democratic context.

Introduction

For many decades, scholars have argued that higher education and development are decisively linked: Education can facilitate human intellectual resources, empower women, cultivate a sense of autonomous decision-making, inculcate civic engagement, and thus contribute to a less authoritarian and more democratic political culture (Inglehart, 1997; Lipset, 1959). However, from the perspective of authoritarian elites, social policy programs can be considered an effective tool to gain support for regime survival (De Mesquita, Smith, Siverson, & Morrow, 2003; Dunning, 2008). The direction of the education effect on authoritarianism remains unclear. This literature brought to the fore a debate on whether higher education expansion can be used as a social policy to garner authoritarian support and values. How does a specific social policy influence authoritarian attitudes?

Much of scholarly attention on the formation of mass political attitudes has been given to cross-sectional comparisons, which cannot completely rule out country-specific factors. In this research design, based on a large-scale higher education expansion in China, I combine spatial differences in the number of university enrollment with temporal differences across cohorts derived from the timing of the expansion to assess the effect of a specific social policy in an authoritarian context. Second, does the effect of social policy vary on authoritarian values? This paper focuses on two major components of authoritarian values: authoritarian support and patriarchal values to investigate the variation. Existing studies tend to examine overall authoritarian values broadly. However, one possible explanation for the mixed evidence of social policy effects on authoritarian values is that using aggregate authoritarian values could be misleading (Ciftci, 2010). It is, therefore, crucial to examine the effects through sub-conceptual lenses by disaggregating authoritarian values into distinct dimensions. Furthermore, the bulk of relevant studies are centered on the relationships between gender equality and democracy (Sanborn & Thyne, 2014), relying on the assumption that one is incidental to the other. Few studies have investigated whether gender equality is coupled with democratic values following improvement in socioeconomic conditions. In this paper, I assess whether and how higher education expansion induces change in au-

thoritarian support and patriarchal values. Third, what are the possible mechanisms that can explain the effect of social policy on authoritarian values? I argue that policy benefit (Miller, Hesli, & Reisinger, 1994) and policy spillover (Moretti, 2004) are two mechanisms that shape political attitudes. The investigation of these two mutually exclusive mechanisms is crucial, given that scholars have often argued that policy benefit alone is insufficient to drive attitudinal change (Lü, 2014).

Empirically, in this paper, I use a combination of spatial and temporal factors to assess authoritarian values by testing the effects of China's higher education expansion in 1999. Temporally, I follow previous studies on the effects of educational expansion (Angrist & Keueger, 1991; Becker, 2003; Breen & Jonsson, 2007) and compare differences across age cohorts derived from the timing of the expansion. Spatially, the expansion was large-scale, covering all the provinces, and yet it was decentralized, like other policy implementation and political institutions in China (Lü, 2014; Mattingly, 2016). Consequently, there is a sizable spatial variation in the expansion process, represented by the differences in the number of university enrollment, which I referred to as expansion intensity. China's higher education expansion provides an ideal case to extend the body of research because China often represents a "most likely case" for authoritarian leadership to control and persist with high levels of authoritarian values in a highly information-controlled environment (Weiss & Dafoe, 2019). To evaluate the education effect, I draw on four waves of Chinese national representative surveys (2010, 2012, 2013, 2015), coupled with regional statistics. Using regional statistics containing the number of higher education expansion intensity at the provincial level is crucial for understanding how the spatial decentralization is likely to matter for the education effect of channeling through the policy benefit mechanism (Lü, 2014). Theoretically, my study contributes to the growing studies on social policy and attitudinal change (Larsen, 2017; Lü, 2014; Mares & Carnes, 2009), adding to the relevant literature by distinguishing between specific and diffuse support as two dimensions of political support, which potentially captures distinctive responses. The social policy may indeed increase authoritarian support when the support represents an immediate policy response (specific

support); in contrast, this effect is unlikely to hold when the support reflects the evaluation of long-term authoritarian traits (diffuse support). Moreover, this study adds a nuanced layer to the existing literature by showing that transformation to more liberal gender values is not always coincident with a decrease in authoritarian support.

Concepts, Theoretical Implications, and Hypotheses

Before moving on to the theoretical implications, I define the central concept of authoritarian values and its two sub-concepts— authoritarian support and authoritarian patriarchal values.

Authoritarian Values

The notion of authoritarian values has received scholarly attention in the literature (Altemeyer, 1981; Stubager, 2008; Weil, 1985). Altemeyer (1981) has defined three facets of attitudinal authoritarianism on values: authoritarian aggression, submission, and conventionalism. The focus of this study is on *authoritarian submission and conventionalism*. Generally, authoritarian submission takes various forms, including supporting the established authoritarian system, obeying its leaders, and being unquestioning of its policies. Specifically, I conceptualize authoritarian submission as a broadly used term for authoritarian support. Following the well-known conceptual distinction by Easton (1965), I further define authoritarian support as two distinctive concepts: specific and diffuse authoritarian support. *Specific authoritarian support* can be understood as current support for an authoritarian government and its leaders. In the authoritarian context, specific support, for instance, can pertain to confidence in the current government and positive evaluation of policy or government under authoritarian rule. *Diffuse authoritarian support*, in contrast, is closely related to stable and long-term commitment to authoritarian institutions or the structure of the authoritarian system, independent of its current performance. It can be observed from individuals' overall assessment of authoritarianism and is, therefore,

fundamentally different from the notion of specific support. It is particularly relevant to distinguish between specific and diffuse authoritarian support. As mentioned, existing findings are mixed regarding the effect of higher education on authoritarian support. I argue that one potential explanation for this variation is that higher education might have a differential effect on distinctive authoritarian supports.

Turning now to authoritarian conventionalism, another facet of authoritarian values, I focus on one crucial dimension of it: authoritarian patriarchal values, referred to as the attitudes toward traditional gender roles. Authoritarian conventionalism is defined as "adherence to the social conventions perceived to be endorsed by society and authorities" (Altemeyer 1981, p.148). This definition might include various hegemonic constructs on attributes such as race, gender, and ethnicity. At its core, authoritarian conventionalism is closely related to adherence to traditional gender roles. In essence, although authoritarian conventionalism does not solely involve traditional gender roles, they are a highly relevant concept in authoritarian regimes. Autocrats often push for patriarchal values and crack down on feminist movements because the formation of gender egalitarianism might enable women to take the main role in agitating for change (Sanborn & Thyne, 2014). In such situations, women have often formed the first organized and open protests. For instance, in Argentine El Salvador and Chile during the 1970s and 1980s, mothers' groups held the very first protests against the authoritarian military governments to address human rights violations (Sanborn & Thyne, 2014).

The questions this paper seeks to answer are whether a specific social policy expansion affects authoritarian support and patriarchal values and, if so, how? What potential theories and mechanisms can help explain these relationships? Will a change in authoritarian support be accompanied by a shift in traditional gender role attitudes? The next sections revisit theories to formulate hypotheses about how and when higher education as a social policy expansion program can influence authoritarian support and authoritarian patriarchal values.

Linking Higher Education with Authoritarian Support

Many studies have provided evidence relating individuals' authoritarian support to a wide range of factors. An early seminal study by Adorno, Frenkel-Brenswik, Levinson, and Sanford (1950) established the notion of "authoritarian personality" and ascribed it to childhood experiences. A rise in survey methods from the 1950s provided evidence that socioeconomic factors such as class, economic development, and education are related to attitudinal variations (Verba & Almond, 1963). Subsequently, literature puts forward crucial evidence on the shaping of authoritarian attitudes. For instance, some studies argue that authoritarian values are socially learned personality characteristics (Altemeyer, 1981). Other studies attribute such values to strong social attachment to conformity (e.g., social norms), which is moderated by perceived levels of threat (Feldman, 2003; Feldman & Stenner, 1997). However, most scholarship centers on a broad strand of explanation: the modernization theories. Advocates of modernization theories contend that there are common conditions conducive to the acceptance of democracy (Inglehart, 1997; Inglehart & Welzel, 2005; Lipset, 1959), which is concomitant with the rejection of authoritarian values. These studies largely provide evidence that predominantly hinges on cross-sectional data, suggesting correlations between individuals' socioeconomic conditions and democracy to support this argument. One crucial socioeconomic condition seen as a byproduct of modernization is high levels of educational attainment. Arguments in these studies have overwhelmingly associated higher education with the rejection of authoritarian values. However, the identification strategy of this line of studies linking education with democratic values could be advanced. As mentioned, the macro-level analyses cannot completely rule out country-specific factors. Certain unobserved factors (e.g., the worthiness of education, social capital provided by the family, and information availability [Sanborn & Thyne, 2014]) may influence individuals' probability of higher education attainment. Another obvious challenge is reverse causality, which would particularly be the case if regions with less authoritarian values proved more likely to have higher levels of education on average. The empirical relationship, therefore, could be spurious.

Indeed, "not all scholars are ready to assume that education leads to the breakdown of authoritarian values" (Sanborn & Thyne, 2014). A survey of "contrarian" studies yields no or little evidence for the claimed relationship between individuals' education and democracy. For instance, Acemoglu and Robinson (2005) recently challenged the view that education is a major cause of democratization. They find that the cross-sectional relationship between education and democracy disappears when country-fixed effects are included in the regression, indicating that country-specific omitted factors drive the relationship. Relatedly, authoritarian rulers must weigh the destabilizing effect of education against effects that may tighten their grip on power (Sanborn & Thyne, 2014). The latter gives autocrats strong incentives to expand education. If a regime makes widespread investment in human capital, skilled workers can focus on accumulating wealth. Economic growth, therefore, benefits leaders by increasing wealth and relieves rivals' fears of arbitrary expropriation (Sanborn & Thyne, 2014). Along these lines, subsequent corroborating evidence indicates that autocracies often implement social policies to appease "critical supporters," referred to as those who are likely to contest the regime, which in turn boosts the loyalty of these supporters, helping the regime solidify power (Knutsen & Rasmussen, 2018).

This paper probes these theoretical arguments by suggesting, alternatively, that the higher education effect on authoritarian attitudes is moderated by the policy benefit and policy spillover mechanisms. A *policy benefit effect* generates benefits to the policy beneficiaries, referred to as individuals who received higher education after its expansion, who are likely to have a favorable opinion of the incumbent government (Miller et al., 1994). The policy benefit effect, in an authoritarian context, means that higher education expansion could be related to greater authoritarian support. Most likely, such favorable opinion could spread to policy non-receivers (Miller et al., 1994), generating a *policy spillover effect.* Because of the potential benefit, individuals exposed to the education expansion program are expected to have higher authoritarian support than individuals who missed out on the expansion program. For these reasons, I expect years of age to the expansion threshold to have a moderating effect on the relationship between expansion intensity and authoritarian sup-

port. Furthermore, the paper probes if the education effect on authoritarian attitudes holds only for the policy beneficiaries—those who received higher education after the expansion.

Moreover, I expect the type of authoritarian support to matter. Following Easton's (1965) distinction between specific and diffuse support, higher education expansion is expected to bolster the evaluation of the current government's performance (specific authoritarian support). Conversely, expansion is expected to have little effect on the long-term commitment to authoritarian institutions (diffuse authoritarian support), which is particularly valid in an information-controlled authoritarian environment. If this happens to be the case, the effect of such an expansion program should vary between the two types of authoritarian support. An observable implication of this argument is that the higher education expansion is expected to have a stronger effect on the immediate, specific authoritarian support than on the long-term diffuse support. Individuals' years of age to the expansion threshold are expected to moderate the effect of such expansion intensity on the authoritarian support. Hypotheses 1a and 1b summarize these theoretical expectations.

Hypothesis 1a :

As higher education expands, individuals increasingly exposed to the expansion program show more specific and diffuse support for autocracy. However, the educational expansion effect on the diffuse support is weaker than on the specific support for autocracy.

Hypothesis 1b :

I expect such effects to exist for both individuals with higher education (policy benefit mechanism) and those without it (policy spillover mechanism). Moreover, I expect such effects to be stronger for individuals with higher education than those individuals without it.

Higher Education and Gender Inequality without Democracy

On the one hand, higher education expansion can be expected to increase commitment to authoritarian values, represented by higher levels of authoritarian support. On the other,

the liberating effects of education can internalize democratic norms and reduce authoritarian patriarchal values, represented by a decline in traditional gender role attitudes (Lipset, 1959). This effect could be attributable to education that provides people with more knowledge about minorities and recognition of prejudice and its danger (Quinley & Glock, 1979, p.188). Moreover, educational expansion challenges the traditional breadwinner model by helping both men and women develop their skills and aspirations and by expanding their opportunities in the labor market (Hannum & Buchmann, 2005). Along these lines, Lipset (1959) sees education as increasing political participation and exposure to diverse stimuli, leading to a significant decline in predisposition to authoritarianism. Similarly, Inglehart (1997) argues that improvement in socioeconomic conditions shifts individuals' focus from survival to self-expression values, which include rejection of authoritarian values, support for democracy, and emphasis on gender equality. Substantially, an implicit assumption in these studies is that gender equality and anti-authoritarianism occurs concurrently as a consequence of development in socioeconomic conditions. One might ask, therefore, if socioeconomic development always leads to a decline in both traditional gender values and authoritarian support.

The education-as-liberation view has not gone untested. Although higher education has been credited with providing students with the ability to recognize democratic values and address gender inequalities, a few factors can condition such effects of education. First, the values brought by education may not be internalized; instead, they stand for superficial socialization. In this respect, the well-educated are simply more familiar with values of democracy and gender equality, rarely internalizing them in their minds. Jackman and Muha (1984) assess the argument on the national level and find that education leads to neither democratic commitment nor a decline in traditional gender stereotypes.

Second, one can argue that the education-as-liberation effect is likely to be conditioned by institutions. For instance, education is not likely to shape anti-authoritarian values when educational content can be amended to garner political support. Cantoni, Chen, Yang, Yuchtman, and Zhang (2017) show that authoritarian states can effectively indoctri-

nate students by introducing new curricula with the intent to shape students' ideology and reinforce support. Similarly, higher education cannot produce values of gender equality in regions where patriarchal institutions still prosper, and social institutions such as traditions and norms limit women's access to resources (Morrisson & Jütting, 2005). Furthermore, studies often demonstrate that leftist parties are more supportive of gender equality and women's labor market participation (Esping-Andersen, 1993). Particularly, in leftist authoritarian regimes, it is part of communist ideology to promote gender equality (Bjarnegård & Melander, 2013). Paradoxically, in these regimes, autocrats often promote authoritarian patriarchy as a backlash against women potentially agitating for change (Sanborn & Thyne, 2014). Specifically, in the Chinese context, the decline of gender equality in recent decades has reawakened traditional gender roles. Before China's reform in the late 1970s, the communist regime implemented work units, which functioned as an institution for providing housing, childcare, medical care, and welfare services. The multi-function of work units as both productive and reproductive institution is highly questionable. For instance, it is a violent shift in policy that has generated labor market segmentation and various forms of inequality. Notwithstanding, work units have historically ensured high levels of labor force participation among women in China (Stockman, 1994). Following economic reform, the function of the work unit as a welfare provider has substantially weakened. At the same time, Stockman (1994) finds that much propaganda revolves around reviving the male breadwinner model and emphasizes patriarchal authoritarianism, for instance, "women's contribution in the family sphere as good mothers." Moreover, a study shows that recently in China, labor market activities for married and educated women become constrained by family obligations due to a lack of provisions in the childcare system, and women are therefore vulnerable to layoffs (Zhang & Pan, 2012). The socioeconomic situation is also likely to condition the effect of education on gender equality. As Hu and Scott (2016) demonstrate, in China, individuals in the underdeveloped rural areas are more likely to hold traditional gender values than individuals in the urban regions. With a two-stage model, I expect that the expansion program renders higher education more accessible among the younger cohort,

referred to as those exposed to the expansion program. If the arguments hold that institutions condition the education-as-liberation effect, higher education is not likely to decline authoritarian patriarchal values in China. The following observable implication summarizes these expectations.

Hypothesis 2 :

Although China's higher education expansion increases the probability of attending higher education for the younger cohort, it does not diminish the cohort's authoritarian patriarchal values.

Background: China's Higher Education Expansion and Decentralization of the Higher Education Provisions

Before moving on to the empirical sections, I briefly describe China's higher education expansion to shed light on the background of the analysis. I outline how variations in expansion intensity, represented as the decentralization of higher education provisions, are an important feature of China's higher education expansion. In 1999, China implemented nationwide education reforms that widely expanded higher education. Figure S.1 displays a clear increase in the college enrollment rate after the expansion program. The policy benefited high school graduates starting in the year 1999, largely increasing their chances of access to higher education. Figure 1 displays the spatial distribution of university enrollment intensity. The years 1997 and 2001 indicate the geographical distribution before and after the expansion program. The map shows that the enrollment intensity increased at an enhanced rate after the expansion program in most regions. However, the level of expansion substantially differed by province—the expansion intensity was much higher in the developed urban regions in the east than in the rural, western areas, which echoes the decentralization of China's higher education and most welfare provisions.

Figure 1: Higher Education Expansion in China
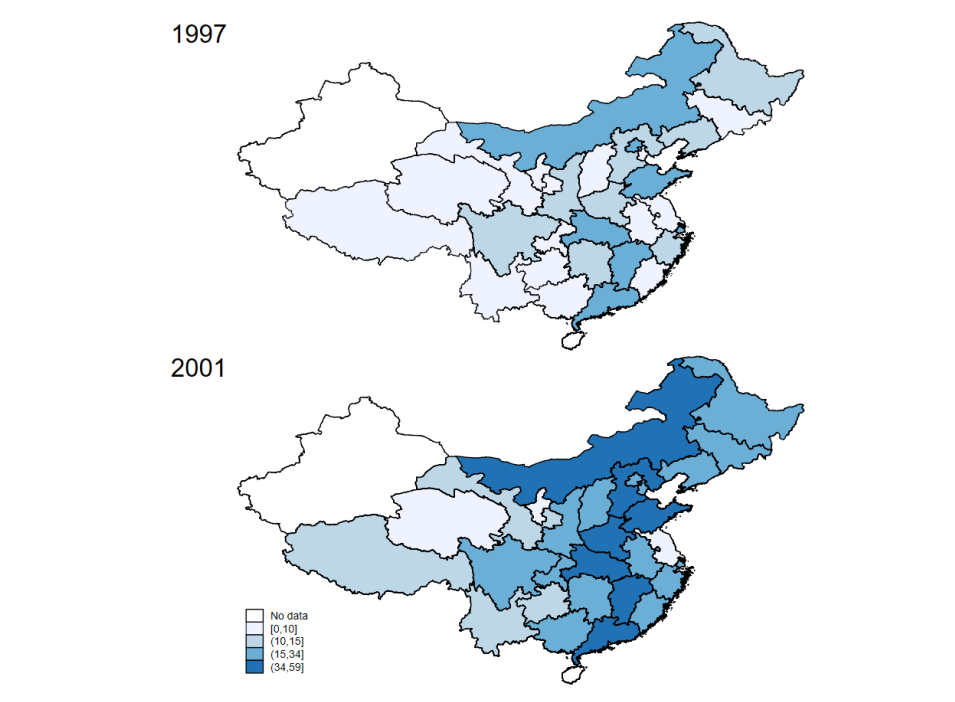
Note: The mainland China maps show how university intensity, a proxy for the number of university enrollment (per 10,000), changed from 1997 to 2001 in mainland China. Darker areas indicate a higher level of expansion intensity. The data is sourced from China's education statistical yearbook.

In China, the provision of welfare services is largely decentralized, and the same is true for higher education provisions, which are often decentralized at the provincial level. The 1994 tax-sharing reform first promulgated the decentralization, resulting in local governments subsidizing the provision of many welfare services and public goods. The decentralization of higher education was later institutionalized in the 1998 higher education law, which specified how various levels of local government were to share the responsibility of managing and financing universities with the central government. The notion of decentralizing admission quotas was stated in 1993 in the State Council's "Outline of China's Education Reform and Development," which declared that local governments are responsible for calculating the admission quota of each university for each province based on provincial higher education intensity and education infrastructure. Consequently, the provincial economic performance and education resources are crucial to the higher education expansion rate for each province. A major contributing factor to the interprovincial differences in higher ed-

ucation expansion is decentralization. For high school students, their chances of accessing higher education are directly related to their province of origin—*hukou*, which is a term for China's household registration system that assigns a province-of-origin status to each child at birth. Only residents with *hukou* in a certain province can access local welfare services, ranging from education to health care. *Hukou*, as a right to local residents, has brought forth interprovincial inequality of socioeconomic well-being. Specifically relating to inequality of educational opportunities, *hukou* has shown less favor to students from disadvantaged provinces of origin. For instance, migrant students must return to their home province to take the provincial National College Entrance Examination. In their home provinces, higher education resources could be limited by low admission quotas, which reduces one's chances of entering a university. For these reasons, the extent of the policy benefit depends not only on being in the younger cohort exposed to the program but also on local higher education intensity, based on one's province of origin. Hence, in the later analyses, I include an interaction between years of age to the expansion threshold (the temporal dimension) and provincial higher education intensity (the spatial dimension) to capture how the interplay between age and education intensity is likely to influence the policy benefit mechanism.

Data and Variables

The survey data is sourced from four waves of the Chinese General Social Survey (CGSS) from 2015, 2013, 2012, and 2010. The CGSS provides good quality surveys based on nationally representative samples from the entire population aged 18 and above. The surveys contain detailed information on respondents' provinces of origin and *hukou* changes, and have been widely used by scholars of Chinese politics (e.g., Mattingly, 2016 and Jiang & Yang, 2016). The selection of the CGSS' primary sampling units is based on the census, and the survey designs employed a stratified five-stage sample design with probabilities proportionate to size and face-to-face interviews. The pooled data of the four waves contains around 45,000 observations. Moreover, I combined the CGSS with regional statistics data on university enrollment intensity at the provincial level, which was retrieved from China's

Educational Statistical Yearbook. Matches are based on individuals' provinces of origin (*hukou* status) at the age of 18 upon university admissions.

The key dependent variables include specific authoritarian support, diffuse authoritarian support, and attitude toward traditional gender roles. The CGSS includes multiple items that measure authoritarian support. These items include 1. "Government abides by the rule of law;" 2. "Government follows the principles of justice and fairness;" 3. "Government helps the poor and promotes equality;" 4. "Governments should not suppress criticism;" 5. "Free and fair election should also be part of the democratic process;" and 6. "It is democratic for the government to entirely decide what works for the people." Questions 4 and 5 are reversed to measure increased authoritarianism at higher levels. The first three items ask the respondents to provide an assessment of current authoritarian governance, while the last three tap in general authoritarian traits. This distinction resonates with Easton's (1965) classification of specific and diffuse support. Based on these questions, two indexes were generated. The first index (*specific support*) measures current support for autocracy and is constructed by adding the first three items. The second index (*diffuse support*) is measured on an additive scale using the last three items. The quantile-quantile plot (Figure S.2, Q-Q plot) in the appendix demonstrates that the two variables capture distinctive concepts of authoritarian support. I further categorized the two indexes to capture the level of authoritarian support, and the responses were located on a three-point scale (low, medium, or high). While the index taps into the degree on the support scale, the categorized operationalization places more weight on the level of support and can often avoid severe measurement error (Margalit, 2013).

Turning to the measurement of authoritarian patriarchal values, to compute *attitude toward traditional gender roles*, the following items from the survey were considered: 1. "men should focus on career, and women should focus on family;" 2. "men are biologically more competent than women;" and 3. "when a recession hits, it is preferable to fire women first." By adding up these three items, an index operationalization of gender attitudes was created. Similarly, the gender attitude index was categorized on a three-point scale. In

the supplementary appendix, I present the findings on dependent variables from the two different measures of the index and categorical operationalizations, and I show that the findings are robust to different ways of operationalizing these variables.[1]

To tap into spatial and temporal expansion, two ways of operationalizing the expansion program are used. First, related to the decentralization of expansion, *university intensity* refers to the spatial distribution of higher education intensity. It is operationalized as the standardized number of university enrollments at the provincial level per 10,000 people, which was a match between provincial college enrollment data and respondents' *hukou* provinces when they were at the age of 18, the average age of students in the final year of school. Notably, the operationalization of university intensity using the current *hukou* province can be highly problematic due to *hukou* changes and self-selection bias. One might expect that some parents from provinces with limited educational resources may have changed their children's province of origin to a province with better educational resources and a higher college admission quota to increase their children's chances of entering a university. To address this potential self-selection problem, the current *hukou* province variable was recoded to account for any *hukou* change before or at the age of 18.[2]

The second operationalization of higher education expansion captures the expansion temporally. The variable *years of age to the threshold* is created to test the hypothesis on the moderating effect of age by deducting respondents' age in 1999 from 18 to denote respondents' years of age to the expansion threshold. As an alternative operationalization and following the use of cohorts from the existing literature (Becker, 2003; Breen & Jonsson, 2007), a binary variable called *younger cohort* is created to indicate those below or equivalent to age 18 in the year 1999. Similarly, self-selection bias is likely to arise regarding the age cohort: it is likely that some students strategically enter college one year later to benefit from the expansion policy. To address the selection issue, in Table S.8, I present findings

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[1]The supporting information S2.1–2.2 in the appendix provides detailed information on the description and operationalization of each variable.

[2]The recoding was based on four variables from the CGSS that contain information on respondents' *hukou* changes: *hukou change*, a binary variable indicating whether a *hukou* was changed, *age when hukou was changed*, *new hukou province*, and *previous hukou province*.

based on two different measures of younger cohorts with ages 18 and 19 as thresholds, and I demonstrate that the results are robust to different ways of operationalizing younger cohorts.

Some important controls were included to capture individual-level heterogeneity and ward off spurious correlations. The cultural implications of modernization theory argue that perception of traditional gender roles (gender stereotype), social trust, social equality, and happiness are likely to be associated with authoritarian support (see Inglehart, 1997). Three indexes on the *perception of social trust*, *perception of social equality*, and *perception of happiness* were created based on the following single items, respectively: "Can you trust most people in this society?" "Do we have an equal society now?" and "Are you living a happy life?" The three items are measured using a five-point Likert scale. Each perception index, therefore, ranges from 1 (lowest) to 5 (highest). Including these controls in the model specifications allows me to account for potential cultural implications on the value shaping.

Finally, I include a series of socioeconomic and demographic controls in the analyses, which may be correlated with both higher education expansion and attitudes. These include gender, religiosity, employment, communist party membership, rural hukou status, ethnicity, occupation, marital status, logged household income, family economic status, number of daughters, and number of sons. Of these controls, the effect of having daughters on gender attitudes is particularly highlighted by the existing studies (Shafer & Malhotra, 2011), which argue that parenting daughters leads to more support for feminist issues and less stringent views on traditional gender roles. Tables S.1 and S.3 show detailed descriptions and summary statistics of the control variables.

Analysis

The Effect of Higher Education on Specific and Diffuse Authoritarian Support

I begin by testing the first set of observable implications H1a and H1b — whether higher education expansion yields policy benefit and spillover effects on specific and diffuse authoritarian support. Higher education expansion is modeled by an interaction term between years of age to the threshold and university intensity. Table 1 presents the main results of four ordered logistic regression models to test the two distinctive types of authoritarian support: specific support (Models 1 and 2) and diffuse support (Models 3 and 4), all in the form of categorical operationalization.[3] All the models include household controls and individual controls. The Prob > χ^2 statistics for the four models are well below 0.05, meaning that the coefficients in the models are different from zero and that the models fit the data. Furthermore, adding the interactions improved the model fit, assessed by a decrease in the information criteria AIC and BIC, from Model 2 to 1 and from Model 4 to 3. An improvement in the model fit indicates that the effect of university intensity differs strongly across age, lending support to that the interaction term yields meaningful findings. Model 2 shows a positive and statistically significant interaction effect between years of age to the threshold and university intensity on the specific support. This result indicates that as higher education expands, there is a statistically significant relationship between individuals increasingly exposed to the program and their specific support for autocracy. However, Model 4 reveals no significant interaction effect when the model is tested on diffuse support, suggesting that Hypothesis 1a of the higher education expansion effect on diffuse support is not supported.

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[3]Table S.4 presents similar findings with the index operationalization of specific and diffuse support.

Table 1: Ordered Logistic Regressions of Specific and Diffuse Support for Autocracy

	Specific Support		Diffuse Support	
	(1)	(2)	(3)	(4)
	Simple	Interaction	Simple	Interaction
Years to the threshold		0.003		0.009
		(0.004)		(0.006)
University intensity		-0.274***		-0.030
		(0.071)		(0.106)
Years to the threshold × University intensity		0.018***		0.008
		(0.005)		(0.009)
Perception of gender stereotype	0.066***	0.070***	0.041***	0.043**
	(0.010)	(0.011)	(0.012)	(0.014)
Perception of social trust	0.145***	0.154***	-0.060*	-0.079*
	(0.028)	(0.032)	(0.031)	(0.034)
Perception of social equality	0.406***	0.380***	0.095**	0.101**
	(0.028)	(0.032)	(0.031)	(0.035)
Happiness level	0.209***	0.237***	0.026	0.028
	(0.034)	(0.039)	(0.039)	(0.044)
Female	0.084	0.177**	0.071	0.106
	(0.053)	(0.062)	(0.063)	(0.073)
Primary school	0.073	0.188	-0.003	0.003
	(0.099)	(0.116)	(0.114)	(0.133)
Secondary education	-0.097	0.096	-0.002	-0.008
	(0.097)	(0.117)	(0.113)	(0.135)
Tertiary vocational college	-0.427**	-0.219	-0.285+	-0.278
	(0.134)	(0.160)	(0.161)	(0.190)
Bachelor	-0.353*	-0.138	-0.863***	-0.731***
	(0.137)	(0.165)	(0.168)	(0.202)
Master and above	-0.580*	-0.154	-1.619***	-1.889***
	(0.260)	(0.302)	(0.296)	(0.390)
Religious	-0.126	-0.164+	0.027	0.080
	(0.080)	(0.089)	(0.102)	(0.113)
Communist party membership	-0.100	-0.074	0.118	0.139
	(0.070)	(0.082)	(0.097)	(0.112)
Rural hukou status	0.006	0.078	0.188*	0.137
	(0.054)	(0.064)	(0.073)	(0.088)
Logged household income	-0.157***	-0.166***	-0.158***	-0.174***
	(0.028)	(0.033)	(0.037)	(0.042)
Other individual controls	✓	✓	✓	✓
Household controls	✓	✓	✓	✓
AIC	11848	9247	9160	7262
BIC	12107	9511	9418	7533
Prob > χ^2	0	0	0	0
Observations	6893	5367	8024	6394

Standard errors in parentheses
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 2: Marginal Effects of University Intensity on Specific and Diffuse Support for Autocracy (Based on Models 2 and 4 in Table 1)
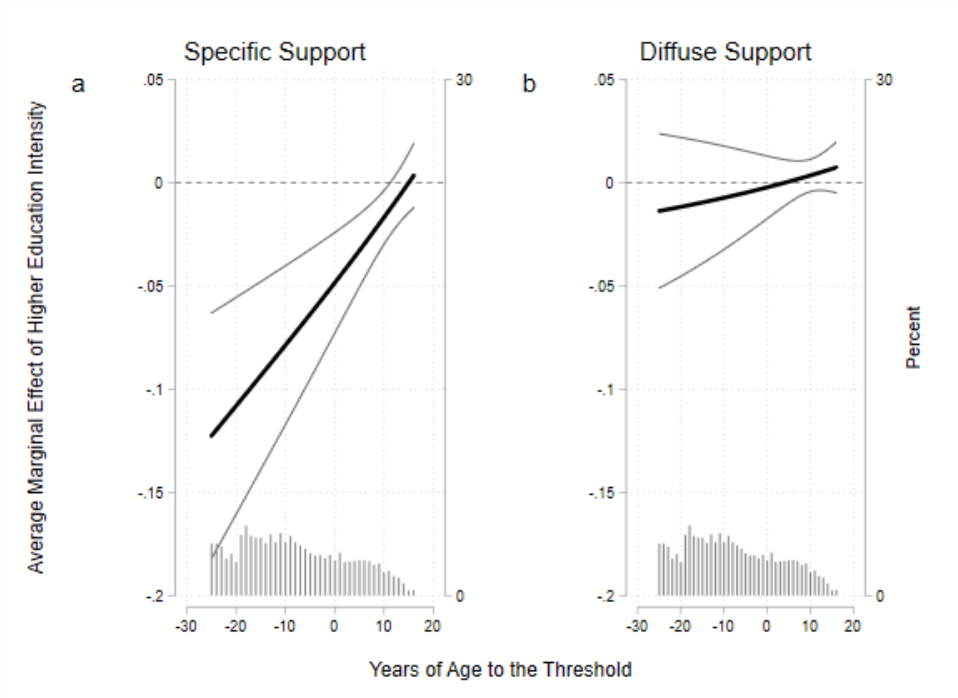
Note: Histogram indicates observation shares. The marginal effects predict the outcomes—high levels of specific and diffuse support for autocracy. The marginal effects are shown with 95 percent confidence intervals and are based on Models 2 and 4.

To help interpret the moderated effect of age, the marginal effect plot (Figure 2) shows predicted probabilities of university intensity on authoritarian support with 95 percent confidence intervals. The confidence intervals test the educational expansion effect on the specific and diffuse authoritarian support that varies at different ages. Individuals below the age threshold are exposed to the expansion (with years to the threshold above or equivalent to 0). Similarly, individuals above the age threshold were not exposed to the program (with years of age to the threshold below 0). In line with Table 1, the interaction effect is not significant on diffuse support (Figure 2b). Figure 2a shows that as higher education expands, individuals who are increasingly exposed to the program show more specific support for autocracy. The effect becomes insignificant when the years to the threshold reach around 10. Although the direction of this effect shows an increasingly positive trend, there is no significant positive effect. Therefore, Hypothesis 1a is generally not supported.

So far, I have not accounted for how the higher education effect channels through the

mechanisms of policy benefit (for those with higher education) and policy spillover (for those without higher education). It is crucial to account for these mechanisms because policy beneficiaries tend to have favorable views of the incumbent government, and such favorable views may spread to the benefit non-receivers, creating a policy spillover effect (Miller et al., 1994; Moretti, 2004).

Figure 3: Marginal Effects of University Intensity on Specific Support for Autocracy (With and Without Higher Education)
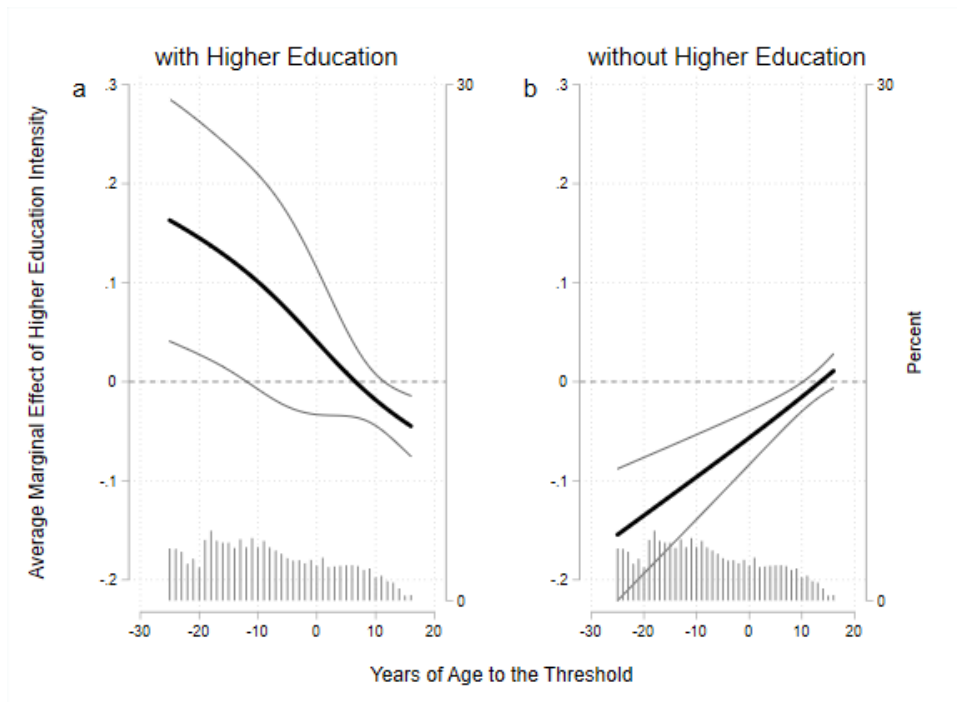
Note: Histogram indicates observed shares. The marginal effect predicts the outcome—a high level of specific support for autocracy. The marginal effects are shown with 95 percent confidence intervals and are based on Model 2.

Figure 3 shows that when the policy benefit mechanism is accounted for, the panels of university intensity effects comparing between individuals with higher education (Figure 3a) and those without (Figure 3b) reveal distinctive patterns. Figure 3a shows significant negative effects on specific support for the latest policy beneficiaries with higher education (years of age above 10). This finding suggests that as higher education expands, expansion policy beneficiaries increasingly show less specific support for autocracy, which stands in sharp contrast to Hypothesis 1b.

Comparing between Figure 3a and Figure 3b, the very contradictory curves indicate that

for individuals without higher education, the more likely they are exposed to the expansion program, the more specific authoritarian support they will show. The plot further suggests that for these policy benefit non-receivers, greater likelihood of exposure to the expansion (years of age above 10) can cancel out the negative effect of the expansion on a specific support. However, it does not make the potential positive spillover effect significant. These main findings on a more negative expansion effect on specific authoritarian support for individuals with higher education (policy benefit) and a more positive albeit non-significant expansion effect for those without higher education (policy spillover) are robust to variation in the model specification. These results hold with alternative index operationalization (Table S.4 and Figures S.3–S.6), when using instrumental variable estimation (Table S.6), and with alternative cohort operationalization (Table S.8). The results also hold when excluding the variables[4] that might cause post-treatment bias (Table S.10 and Figures S.10–S.11).

In support of hypothesis 1a, these findings show that the expansion effects are highly differentiated based on the types of authoritarian support. For specific authoritarian support, the more recently exposed to the expansion program the policy beneficiaries are, the more specific support they are likely to show. By contrast, there is no significant effect of expansion on diffuse authoritarian support. In contrast to Hypotheses 1b, there is no evidence that higher education expansion is likely to channel through policy benefit mechanisms on increasing specific support for autocracy for policy beneficiaries. However, there is an increasingly positive, albeit non-significant spillover effect for such support. The findings are in line with the argument by Sanborn and Thyne (2014): Education may lead to rejection of authoritarian values even in autocracies. Furthermore, the findings add to the literature that the type of authoritarian support matters. Although these overall findings on specific support are striking in an authoritarian context, and they partly support the idea of education-as-liberation, there is no empirical evidence suggesting that the expansion can similarly weaken diffuse authoritarian support—the entrenched long-term authoritarian

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[4]These variables include perception of a gender stereotype, perception of social trust, perception of social equality, and happiness level.

trait.

One implicit assumption in the relevant modernization literature is that higher education and improvement in socioeconomic conditions concurrently bring about a decline in another dimension of authoritarian values—authoritarian patriarchal values. In the next section, I move on to probe whether higher education expansion can lead to a decline in traditional gender role attitudes without decreasing entrenched long-term authoritarian values.

Higher Education Expansion and Authoritarian Patriarchal Values

The second observable implication of the theory is that higher education expansion increases the chances of attending universities for the younger cohort, which may not reduce their authoritarian patriarchal values, represented by their traditional gender role attitudes. As with most observational studies, demonstrating a convincing causal effect remains a concern. Reversed causality and omitted variable bias can arise with observational data. For instance, individuals with a higher belief in gender equality, in particular, might like to pursue higher education. The causal direction, therefore, may go both ways. To address the endogeneity issue, I apply a two-stage least squares instrumental variable (2SLS-IV) approach. The principle of 2SLS is identical to a Wald estimator but more flexible in the sense that it can increase estimate precision by pooling several instruments. I present findings that account for some important potential confounders with the following model specification:

$$X_i = \alpha_0 + \alpha_1 Z_{1i} \times Z_{2i} + \eta_i + \varepsilon_i \tag{1}$$

$$Y_i = \beta_0 + \beta_1 \widehat{X}_i + \mu_i + \upsilon_i \tag{2}$$

where the first equation presents the first stage. For each individual i, X_i is the binary treatment variable for whether i gets into higher education. The instrumental variable is an interaction between Z_{1i} and Z_{2i}; Z_{1i} is the binary variable indicating the younger cohort, and Z_{2i} denotes university intensity. I also include matrices of conditioning variables η_i and

μ_i in both equations. The second equation presents the second stage, where $\widehat{X}_i$ is the point estimate from the first equation; Y_i is an index showing the attitude toward traditional gender roles.

IV literature has demonstrated that several conditions must be met to deliver unbiased results with valid instruments (Sovey & Green, 2011). First, the instrument must be sufficiently strong to motivate a clear change in the probability of treatment. To fulfill the condition of a strong instrument, I report Kleibergen-Paap F statistic in the IV results. Building on previous research highlighting the importance of age cohort (Angrist & Keueger, 1991) and decentralization (Lü, 2014) as factors influencing education outcomes, I use an interaction of younger cohort and university intensity as an instrument. With the F statistics well above 10 (F statistics = 254 in the baseline models and 77 in the full models), the null hypothesis of a weak instrument can be well rejected.

Another condition is the independence assumption, which indicates that the instrument must be uncorrelated with the error terms (Sovey & Green, 2011). In this sense, the instrument should not be related to unmeasured causes of the dependent variable. As mentioned, to address the independence assumption, I include a series of controls that can be related to the interaction (younger cohort × intensity) and gender role attitudes. These controls consist of, for instance, female, number of daughters, number of sons, religious status, and ethnicity. The final and most critical condition is the exclusion restriction. It requires that the instrument cannot affect the outcome directly or through other variables, and the backdoor paths have to be conditioned. It is impossible to conclude whether exclusion restriction holds by testing that the interaction of the younger cohort and university intensity will not have a direct effect on gender role attitudes that can bypass getting into higher education. Nevertheless, it is plausible to inspect the design and block potential backdoor paths from the instrument to the outcome variable (Sovey & Green, 2011). Empirically and theoretically, there could be two potential backdoor channels: rural residence and employment status. The rural residence is considered a backdoor channel because it is often argued that in China, egalitarian gender attitudes are unevenly distributed, and that traditional

Table 2: 2SLS IV Estimation on Traditional Gender Roles around Age Threshold (+/-16 Years)

	Baseline Model		Full Model	
	(1)	(2)	(3)	(4)
	1st Stage	2nd Stage	1st Stage	2nd Stage
Higher education		-5.393***		-4.788***
		(0.318)		(0.624)
Younger cohort	0.063***		0.058***	
	(0.010)		(0.010)	
University intensity	0.246***		0.100***	
	(0.020)		(0.023)	
Younger cohort × University intensity	-0.239***		-0.095***	
	(0.021)		(0.023)	
Female			0.004	-0.633***
			(0.006)	(0.050)
N. of daughters			-0.043***	0.092+
			(0.004)	(0.054)
N. of sons			-0.057***	0.126+
			(0.004)	(0.065)
Employed			0.022***	-0.134*
			(0.006)	(0.059)
Rural hukou			-0.205***	-0.350**
			(0.007)	(0.134)
Religious			-0.021**	-0.017
			(0.008)	(0.080)
Communist party membership			0.028***	0.064
			(0.006)	(0.055)
Mongolian			0.046	-0.015
			(0.056)	(0.487)
Manchu			-0.031	-0.196
			(0.032)	(0.273)
Tibetan			0.111	-0.129
			(0.212)	(1.388)
Uyghurs			-0.088*	-0.123
			(0.034)	(0.484)
Other ethnic groups			-0.007	0.011
			(0.008)	(0.089)
N	17361	17361	13166	13166
Kleibergen-Paap F stat		254		77
Kleibergen-Paap LM Test p-value		0		0

Robust standard errors in parentheses.

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

gender role attitudes are still much more prevalent in rural China than in the cities (Shu & Zhu, 2012). Existing literature has also highlighted that employment status can relate to gender role attitudes. For instance, working women tend to develop more liberal modern conceptions of gender roles (see Steiber & Haas, 2009). Conditioning these two channels is likely to block the backdoor paths and increase the confidence of estimation.

Table 2 shows such IV estimation restricted data around expansion threshold (+/- 16 years). In columns 1 and 2 of Table 2, I present the baseline findings without conditioning variables. Column 1 shows that both younger cohort and university intensity are positively associated with higher education. Moreover, a significant interaction demonstrates that the effect of university intensity on attending higher education depends significantly on the younger cohort. Column 2 reveals the effect of higher education on traditional gender role attitudes: Higher education significantly decreases traditional gender role views by 5.39. The simple baseline test is important because it shows that the results are not driven by a specific set of or any conditioning variables.

Columns 3 and 4 report the results of conditioning on socioeconomic and demographic variables. The IV coefficient in column 3, the interaction between younger cohort and university intensity, is highly significant, meaning that the intensity effect on gender role attitudes varies significantly depending on the cohort. Belonging to the younger cohort increases the chances of higher education by 0.06. Similarly, university intensity is positively related to higher education (with a coefficient of 0.10). Consistent with the baseline findings, column 4 shows a highly statistically significant and sizable effect of higher education on decreasing traditional gender role attitudes by 4.79. These findings stand in sharp contrast to the overall theoretical expectation suggested in Hypothesis 2. Attending higher education does not reinforce authoritarian patriarchal values. To the contrary, comparing individuals with higher education to those without, educational expansion leads to a sharp decline in such attitudes.

Figure 4: Heterogeneous Treatment Effects (Region as Subsample)
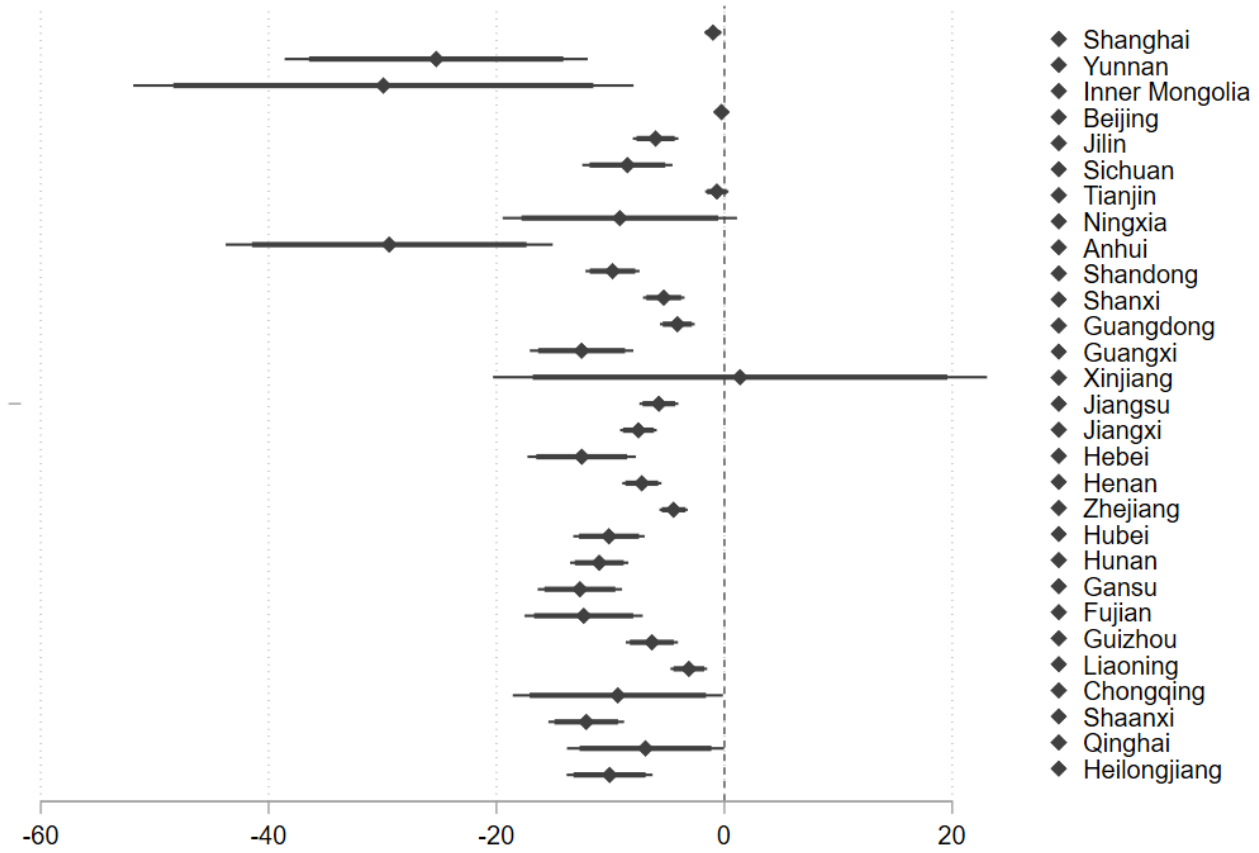
Note: The plot shows the higher education's effect on traditional gender attitudes within each region as a subsample. The plot is based on the baseline 2SLS-IV regression with 95 and 90 percent confidence intervals.

One possible rival explanation for these findings is that the effect of education on the decline in traditional gender role attitudes may be limited to provinces of China where traditional gender norm persists. The development status of individual province could, therefore, drive the results. To address this issue, I reran the IV models and included the provincial fixed effects (see Table S.9) [5]. The estimated effects are even larger with provincial fixed effects (with significant coefficients of -6.70 for the baseline model and -5.87 for the full model). An interesting related extension is that the educational effect may vary across different provinces. The estimated education effect is likely to depend on the current level of regional gender equality and the room for it to decline. In Figure 4, I reran the

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[5]Notably, the provincial fixed effect was left out for the main analysis due to the concern that it may be correlated with university intensity.

models by breaking the sample into subsamples based on individual provinces. I find that traditional gender views only slightly decline in the most urbanized provinces. One possible explanation is that liberal gender views already may have prevailed in these areas before the educational expansion.

Figure 5: Effect of Higher Education on Traditional Gender Role Attitudes around Age Threshold in Bandwidths of Age Cohorts
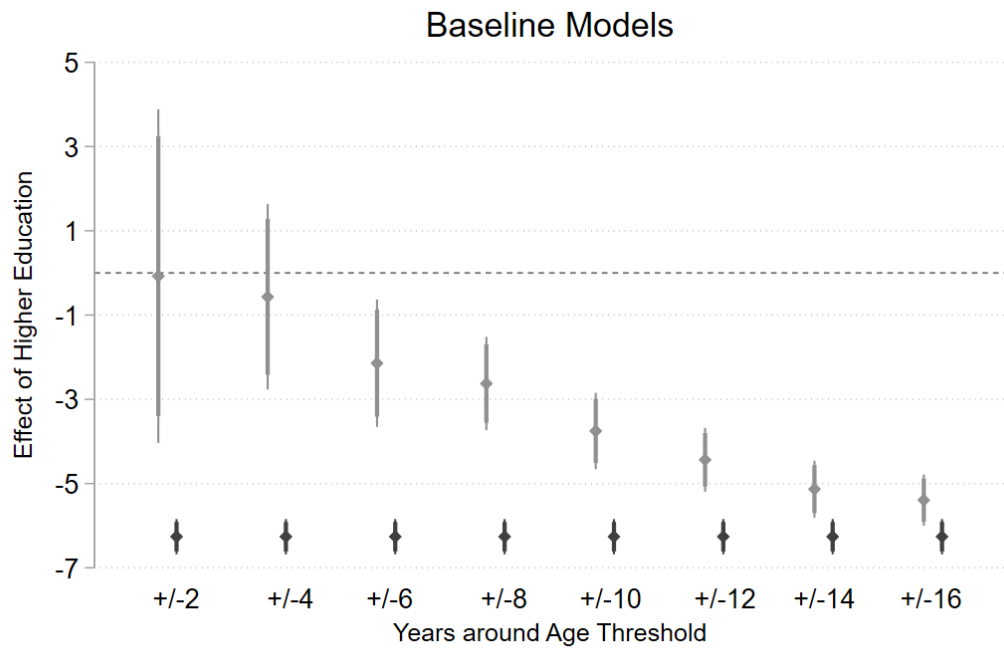
Note: This figure demonstrates the effect of higher education on traditional gender role attitudes using data around different age thresholds based on the IV-2SLS models. Each circle indicates a point estimate, and the vertical bars are the 95 and 90 percent confidence intervals. The darker bars are based on baseline models only excluding the most urbanized provinces. The lighter bars are based on baseline models without regional exclusion.

Another concern is that the results are driven by cohort replacement, which related studies (e.g., Brooks & Bolzendahl, 2004) have used to capture attitudinal changes. It could be the case that unobserved cohort-related individual characteristics influence gender role attitudes. Figure 5 displays the higher education effect in bandwidths of cohorts close to the age threshold. It shows the effects above and below the threshold in windows of two years, four years, and up to 16 years. The darker bars are based on baseline models excluding the most urbanized provinces[6]. The lighter bars are baseline models without

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[6]The two provinces excluded in the sample are Beijing and Shanghai.

regional exclusion. As Figure 5 shows, without regional exclusion, the effects initially center around 0 and are insignificant. Significant negative effects start to appear from the 6-year window onward. However, when only including less urbanized regions, there is a strong and significant effect of higher education on declining traditional gender roles that already exist beginning with the 2-year window. These results provide evidence that higher education's effect on gender attitudes is not completely driven by cohort characteristics. Instead, it is also likely to be driven by regional urbanization status. Similar results exist when running full models with controls (see Figure S.9). Another explanation for the outcome may be that the findings are driven by selection bias. Again, it could be that students just above the age threshold strategically choose to sit in the college entrance exam one year later to benefit from the expansion policy. In Appendix S.8, I rerun the models using age 19 as an age threshold. The estimates are almost unchanged and still highly statistically significant.

Conclusion

The study has examined the effect of higher education expansion in China on two facets of authoritarian values: authoritarian support and patriarchal values. Although many studies have underscored the importance of social policy for regime survival, the empirical analysis shows that social policy is not an elixir for maintaining regime support. In contrast to the policy benefit explanation, the recent higher education expansion in China has significantly diminished specific authoritarian support. The analysis also clarifies that the effect is differentiated based on the type of authoritarian support. While higher education and education expansion can diminish authoritarian support when that support refers to an immediate response (specific support), it has not influenced the long-term authoritarian trait (diffuse support). Although modernization theories often argue that improvement in socioeconomic conditions will lead to declines in both authoritarian and patriarchal values, this study reveals that higher education expansion is not a solution for both. While it is unlikely to decline the deeply ingrained diffused authoritarian values, educational expansion can substantially weaken authoritarian patriarchal values, particularly in the less urbanized

regions.

Although the findings are representative of China, one question that arises naturally is whether the arguments advanced in the paper are generalizable beyond China—a single-party authoritarian country. Scholars have noted that similar expansions of social policy exist as a means of garnering authoritarian support in other parts of the developing world. For instance, the Brazilian military government in the 1970s initiated health benefits and social security coverage to the rural population to respond to pressure from rural activists (Falleti, 2009). Recently in Kenya, the incumbent government increased social policy spending by abandoning school fees to gain support (Harding & Stasavage, 2013). Along these lines and more broadly, Mares and Carnes (2009) find that in Asia, Africa, and Latin America, the numbers of old age and disability insurance policies instituted by authoritarian countries are overwhelmingly greater than in democratic countries.

This study points to somewhat different theoretical implications from those in the existing literature. Instead of focusing on a single dimension of authoritarian value, the focus on both authoritarian support and patriarchal values allow assessing multiple implications of higher education expansion. For instance, the evidence suggests that the extent to which autocrats can indoctrinate authoritarian values through the policy benefit mechanism is constrained. As an expansion program continues, its beneficiaries—younger individuals with higher education—increasingly show less specific authoritarian support. This finding stands in contrast to the argument prominent in the literature that social policy can be an effective tool to garner political support among the policy beneficiaries. Crucially, such a converse effect is only salient to the younger cohort with higher education, not to those without such education. An interesting avenue for subsequent research could be to fully explain the micro-foundations underlying this pattern and elaborate on whether the higher education effect is likely to spread and cultivate a more democratic culture among the masses. Moreover, the findings reveal that, despite no change in diffused authoritarian support, the educational expansion still brings about a transformative shift of the traditional gender attitudes toward the liberal side. Crucially, education's impact on transforming gender attitudes

matters little to regions more urbanized and rich in resources, but greatly to less urbanized regions. One possible explanation, as noted earlier, is that in more resource-rich urbanized regions, gender egalitarianism may have already prevailed before the educational expansion. A thorough reassessment of this explanation is needed for future research. Furthermore, the findings show no education expansion impact on decreasing diffuse support, the long-term fundamental authoritarian trait. In the words of Sanborn and Thyne (2014), "education is unlikely to produce liberalization when [students] lack access to unbiased information and alternative forms of governance." Future research may explore underlying mechanisms such as media bias and course syllabus that might also explain the effect of education on attitudinal change. Finally, the study suggests that higher education is effective in fostering toward a gender-egalitarian society, even if not accompanied by a fundamental shift toward more democratic values.

References

Acemoglu, D., & Robinson, J. A. (2005). *Economic origins of dictatorship and democracy.* London: Cambridge University Press.

Adorno, T., Frenkel-Brenswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The Authoritarian personality.* New York: Harper.

Altemeyer, B. (1981). *Right-wing authoritarianism.* Winnipeg: University of Manitoba Press.

Angrist, J. D., & Keueger, A. B. (1991). Does compulsory school attendance affect schooling and earnings? *The Quarterly Journal of Economics*, *106*(4), 979–1014.

Becker, R. (2003). Educational expansion and persistent inequalities of education: Utilizing subjective expected utility theory to explain increasing participation rates in upper secondary school in the Federal Republic of Germany. *European Sociological Review*, *19*(1), 1–24.

Bjarnegård, E., & Melander, E. (2013). Revisiting representation: Communism, women in politics, and the decline of armed conflict in East Asia. *International interactions*, *39*(4), 558–574.

Breen, R., & Jonsson, J. O. (2007). Explaining change in social fluidity: Educational equalization and educational expansion in twentieth-century Sweden. *American Journal of Sociology*, *112*(6), 1775–1810.

Brooks, C., & Bolzendahl, C. (2004). The transformation of US gender role attitudes: Cohort replacement, social-structural change, and ideological learning. *Social Science Research*, *33*(1), 106–133.

Cantoni, D., Chen, Y., Yang, D. Y., Yuchtman, N., & Zhang, Y. J. (2017). Curriculum and ideology. *Journal of Political Economy*, *125*(2), 338–392.

Ciftci, S. (2010). Modernization, Islam, or social capital: What explains attitudes toward democracy in the Muslim world? *Comparative Political Studies*, *43*(11), 1442–1470.

De Mesquita, B., Smith, A., Siverson, R. M., & Morrow, J. D. (2003). *The logic of political survival.* MIT press.

Dunning, T. (2008). *Crude democracy: Natural resource wealth and political regimes* (Vol. 7). Cambridge University Press Cambridge.

Easton, D. (1965). *A system analysis of political life.* New York: John Wiley.

Esping-Andersen, G. (1993). *Changing classes: Stratification and mobility in post-industrial societies.* New York: Sage.

Falleti, T. G. (2009). Infiltrating the state: The evolution of health care reforms in Brazil, 1964–88. In J. Mahoney & K. Thelen (Eds.), *Explaining institutional change: ambiguity, agency, and power* (pp. 38–62). Cambridge: Cambridge University Press.

Feldman, S. (2003). Enforcing social conformity: A theory of authoritarianism. *Political Psychology*, *24*(1), 41–74.

Feldman, S., & Stenner, K. (1997). Perceived threat and authoritarianism. *Political Psychology*, *18*(4), 741–770.

Hannum, E., & Buchmann, C. (2005). Global educational expansion and socio-economic development: An assessment of findings from the social sciences. *World Development*, *33*(3), 333–354.

Harding, R., & Stasavage, D. (2013). What democracy does (and doesn't do) for basic services: School fees, school inputs, and African elections. *The Journal of Politics*, *76*(1), 229–245.

Hu, Y., & Scott, J. (2016). Family and gender values in China: Generational, geographic, and gender differences. *Journal of Family Issues*, *37*(9), 1267–1293.

Inglehart, R. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies.* Princeton: Princeton University Press.

Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy: The human development sequence.* London: Cambridge University Press.

Jackman, M. R., & Muha, M. J. (1984). Education and intergroup attitudes: Moral enlightenment, superficial democratic commitment, or ideological refinement? *American Sociological Review*, 751–769.

Jiang, J., & Yang, D. L. (2016). Lying or believing? Measuring preference falsification from

a political purge in China. *Comparative Political Studies*, *49*(5), 600–634.

Knutsen, C. H., & Rasmussen, M. (2018). The autocratic welfare State: Old-age pensions, credible commitments, and regime survival. *Comparative Political Studies*, *51*(5), 659–695.

Larsen, E. G. (2017). Welfare retrenchments and government support: Evidence from a natural experiment. *European Sociological Review*, *34*(1), 40–51.

Lipset, S. M. (1959). Some social requisites of democracy: Economic development and political legitimacy. *American Political Science Review*, *53*(1), 69–105.

Lü, X. (2014). Social policy and regime legitimacy: The effects of education reform in China. *American Political Science Review*, *108*(2), 423–437.

Mares, I., & Carnes, M. E. (2009). Social policy in developing countries. *Annual Review of Political Science*, *12*, 93–113.

Margalit, Y. (2013). Explaining social policy preferences: Evidence from the great recession. *American Political Science Review*, *107*(1), 80–103.

Mattingly, D. C. (2016). Elite capture: How decentralization and informal institutions weaken property rights in China. *World Politics*, *68*(3), 383–412.

Miller, A. H., Hesli, V. L., & Reisinger, W. M. (1994). Reassessing mass support for political and economic change in the former USSR. *American Political Science Review*, *88*(2), 399–411.

Moretti, E. (2004). Workers' education, spillovers, and productivity: Evidence from plant-level production functions. *American Economic Review*, *94*(3), 656–690.

Morrisson, C., & Jütting, J. P. (2005). Women's discrimination in developing countries: A new dataset for better policies. *World Development*, *33*(7), 1065–1081.

Quinley, H. E., & Glock, C. Y. (1979). *Anti-semitism in America*. New York: Free Press.

Sanborn, H., & Thyne, C. L. (2014). Learning democracy: Education and the fall of authoritarian regimes. *British Journal of Political Science*, *44*(4), 773–797.

Shafer, E. F., & Malhotra, N. (2011). The effect of a child's sex on support for traditional gender roles. *Social Forces*, *90*(1), 209–222.

Shu, X., & Zhu, Y. (2012). Uneven transitions: Period-and cohort-related changes in gender attitudes in China, 1995–2007. *Social Science Research*, *41*(5), 1100–1115.

Sovey, A. J., & Green, D. P. (2011). Instrumental variables estimation in political science: A readers' guide. *American Journal of Political Science*, *55*(1), 188–200.

Steiber, N., & Haas, B. (2009). Ideals or compromises? The attitude–behaviour relationship in mothers' employment. *Socio-Economic Review*, *7*(4), 639–668.

Stockman, N. (1994). Gender inequality and social structure in urban China. *Sociology*, *28*(3), 759–777.

Stubager, R. (2008). Education effects on authoritarian–libertarian values: A question of socialization. *The British Journal of Sociology*, *59*(2), 327–350.

Verba, S., & Almond, G. (1963). *The civic culture: Political attitudes and democracy in five nations*. New York: SAGE Publications.

Weil, F. D. (1985). The variable effects of education on liberal attitudes: A comparative-historical analysis of anti-semitism using public opinion survey data. *American Sociological Review*, 458–474.

Weiss, J. C., & Dafoe, A. (2019). Authoritarian audiences, rhetoric, and propaganda in international crises: Evidence from China. *International Studies Quarterly*.

Zhang, Q. F., & Pan, Z. (2012). Women's entry into self-employment in urban China: The role of family in creating gendered mobility patterns. *World Development*, *40*(6), 1201–1212.

Gender Equality without Democracy? Evidence from a Large-Scale Higher Education Expansion in China

Supplementary Appendix

1 Background

Figure S.1: China's College Enrollment Rate from (1977—2012)

2 Data and Descriptive Statistics

2.1 Variables Definition

Table S.1

Variable	Variable Definition
Dependent Variables:	
$specific\_support\_ca$	Categorical operationalization for the levels of specific support for autocracy
$diffuse\_support\_ca$	Categorical operationalization for the levels of diffuse support for autocracy
$traditionalgenderroles\_ca$	Categorical operationalization for the attitudes toward traditional gender roles
$specific\_support\_index$	Index operationalization for the specific support for autocracy
$diffuse\_support\_index$	Index operationalization for the diffuse support for autocracy
$traditionalgenderroles\_index$	Index operationalization for the attitudes toward traditional gender role
Independent and Control Variables:	
$agethreshold$	Years of age to the threshold (age 18) in 1999
$z2nenrolment$	Higher education intensity, operationalized from the standardized number of university enrollments at the provincial level per 10,000 people, which was a match between provincial college enrollment data and respondents' *hukou* provinces when they were at the age of 18, the average age of students in the final year of school.
$highereducation$	Binary variable indicating whether a respondent has higher education
$traditionalgenderroles_index$	Index operationalization for the attitudes toward traditional gender roles
$socialtrust$	Perception of social trust
$socialequality$	Perception of social equality
$happiness$	Happiness level
$female$	Binary variable indicating female
$education$	Categorical variable indicating the highest level of education
$religiosity$	Binary variable indicating whether a respondent is religious
$employment$	Binary variable measuring whether a respondent is employed
$communist$	Binary variable indicating whether a respondent is a member of communist party
$rural$	Binary variable indicating whether a respondent's household registration is rural
$ethnicity$	Categorical variable indicating ethnicity
$occupation$	Categorical variable indicating occupation-based social classification based on EGP class scheme
$maritalstatus$	Categorical variable indicating marital status
$lnhhincome$	Natural logarithm of annual household income
$familyeconomicstatus$	Categorical variable indicating the family economic status
$child$	Binary variable measuring whether a respondent has children
$ndaughter$	Number of daughters
$nson$	Number of sons

2.2 Index and Categorical Operationalization for the Dependent Variables

Table S.2: Operationalization

Dependent variable	Item	Operationalization	Scale
specific_support_ca	*satisfaction_law*: Government abides by the rule of law (likert scale of 5 points)	categorical operationalization	Likert scale of 3 points:
	satisfaction_justice: Government follows the principles of justice and fairness (likert scale of 5 points)		1=Low
	satisfaction_equality: Government helps the poor and promotes equality (likert scale of 5 points)		2=Medium
			3=High
diffuse_support_ca	*criticism_reversed*: scale reversed of "governments should not suppress criticism" (likert scale of 5 points)	categorical operationalization	Likert scale of 3 points:
	election_reversed: scale reversed of "free and fair election should also be part of the democratic process" (likert scale of 5 points)		1=Low
	authoritarian: It is democratic for the government to entirely decide what works for the people (likert scale of 2 points)		2=Medium
			3=High
traditionalgenderroles_ca	*traditionalgenderrole1*: Men should focus on career, and women should focus on family (likert scale of 5 points)	categorical operationalization	Likert scale of 3 points:
	traditionalgenderrole2: Men are biologically more competent than women (likert scale of 5 points)		1=Low
	traditionalgenderrole3: When a recession hits, it is preferable to fire women first (likert scale of 5 points)		2=Medium
			3=High
specific_support_index	*satisfaction_law*: Government abides by the rule of law (likert scale of 5 points)	index operationalization	it ranges between 1 (lowest) and 13 (highest)
	satisfaction_justice: Government follows the principles of justice and fairness (likert scale of 5 points)		
	satisfaction_equality: Government helps the poor and promotes equality (likert scale of 5 points)		
diffuse_support_index	*criticism_reversed*: scale reversed of "government should not suppress criticism" (likert scale of 5 points)	index operationalization	it ranges between 1 (lowest) and 13 (highest)
	election_reversed: scale reversed of "free and fair election should also be part of the democratic process" (likert scale of 5 points)		
	authoritarian: It is democratic for the government to entirely decide what works for the people (likert scale of 2 points)		
traditionalgenderroles_index	*traditionalgenderrole1*: Men should focus on career, and women should focus on family (likert scale of 5 points)	index operationalization	it ranges between 1 (lowest) and 13 (highest)
	traditionalgenderrole2: Men are biologically more competent than women (likert scale of 5 points)		
	traditionalgenderrole3: When a recession hits, it is preferable to fire women first (likert scale of 5 points)		

2.3 Descriptive Statistics

Table S.3: Summary Statistics

	μ	σ	Min	Max	N
Dependent Variables:					
$specific\_support\_ca$	2.20	0.61	1	3	10299
$diffuse\_support\_ca$	1.97	0.42	1	3	9515
$genderstereotype\_ca$	1.89	0.58	1	3	44370
$specific\_support\_index$	7.79	2.39	1	13	10299
$diffuse\_support\_index$	7.04	2.09	1	13	9515
$genderstereotype\_index$	6.61	2.56	1	13	44370
Independent Variables:					
$agethreshold$	-16.69	15.72	-50	16	44993
$z2nenrolment$	0	1	-0.53	6.36	34961
$highereducation$	0.08	0.27	0	1	44947
$genderstereotype_index$	6.61	2.56	1	13	44370
$socialtrust$	3.43	1.03	1	5	44923
$socialequality$	3.05	1.06	1	5	44880
$happiness$	3.80	0.85	1	5	44872
$female$	0.51	0.50	0	1	44996
$religiousity$	0.13	0.33	0	1	33621
$employment$	0.63	0.48	0	1	44987
$communist$	0.29	0.45	0	1	44843
$rural$	0.58	0.49	0	1	44907
$lnhhincome$	10.35	1.09	5.25	16.12	39572
$child$	0.87	0.33	0	1	44948
$ndaughter$	0.79	0.91	0	10	44894
$nson$	0.92	0.87	0	8	44919

Figure S.2: Quantile-Quantile (Q-Q) Plot
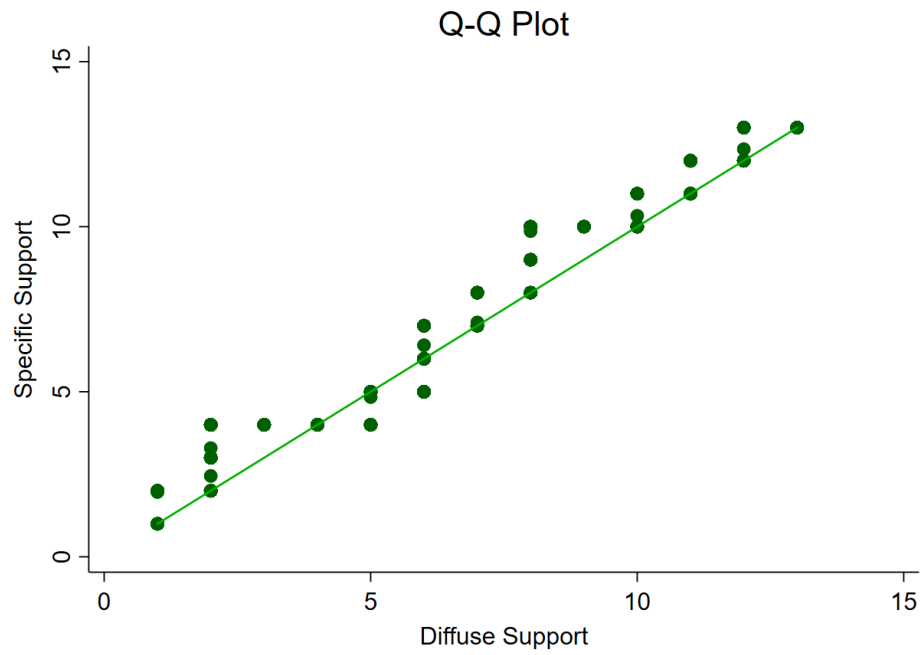
Note: The Q-Q plot above shows if the two measures of authoritarian support — diffuse support and specific support for autocracy have a common distribution. The vertical axis indicates estimated quantiles from the specific support for autocracy. The horizontal axis indicates estimated quantiles from the diffuse support for autocracy.

3 Robustness Checks

3.1 Using Index Operationalization

Table S.4: OLS Regressions of Specific and Diffuse Support for Autocracy

	(1) Specific support	(2) Diffuse support
Years of age to the threshold	0.008[+]	0.009[+]
	(0.005)	(0.005)
Higher education intensity	-0.347***	-0.092
	(0.077)	(0.081)
Years of age to the threshold X Higher education intensity	0.021***	0.010
	(0.006)	(0.007)
Perception of gender stereotype	0.074***	0.008
	(0.012)	(0.011)
Social trust	0.205***	-0.072**
	(0.034)	(0.026)
Perception of social equality	0.494***	0.178***
	(0.033)	(0.027)
Happiness level	0.295***	0.059[+]
	(0.042)	(0.034)
Female	0.254***	0.042
	(0.067)	(0.056)
Primary school	-0.026	-0.018
	(0.127)	(0.103)
Secondary education	-0.091	-0.140
	(0.128)	(0.104)
Tertiary vocational college	-0.443*	-0.403**
	(0.174)	(0.147)
Bachelor	-0.411*	-0.740***
	(0.181)	(0.160)
Master and above	-0.459	-2.469***
	(0.334)	(0.377)
Religious	-0.158	0.013
	(0.097)	(0.087)
Employed	-0.241*	-0.117
	(0.110)	(0.102)
Communist party membership	-0.134	0.229**
	(0.089)	(0.089)
Rural hukou	0.084	0.122[+]
	(0.070)	(0.067)
Other individual controls	Yes	Yes
Household controls	Yes	Yes
R-squared	0.146	0.045
Adjusted R-squared	5367	6394

Standard errors in parentheses
[+] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure S.3: Marginal Effects of Higher Education Intensity on Specific and Diffuse Support for Autocracy (Based on Regressions in Table S.4)
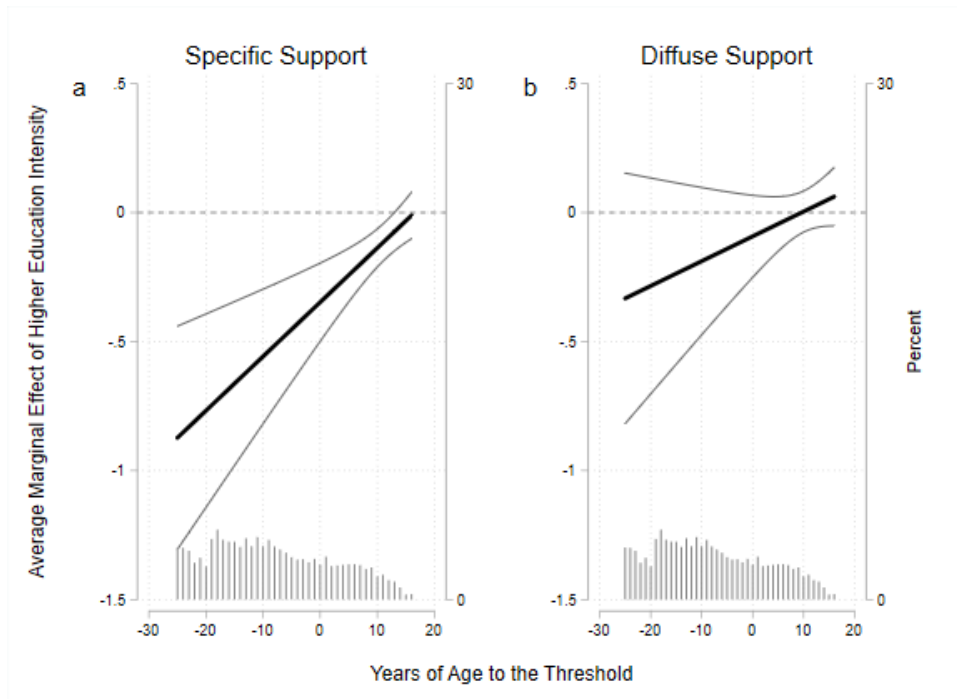
Note: Histogram indicates the observation shares. The marginal effects are shown with 95 percent CI.

Figure S.4: Marginal Effects of Higher Education Intensity on Specific Support for Autocracy (Comparing Between with and without Higher Education)
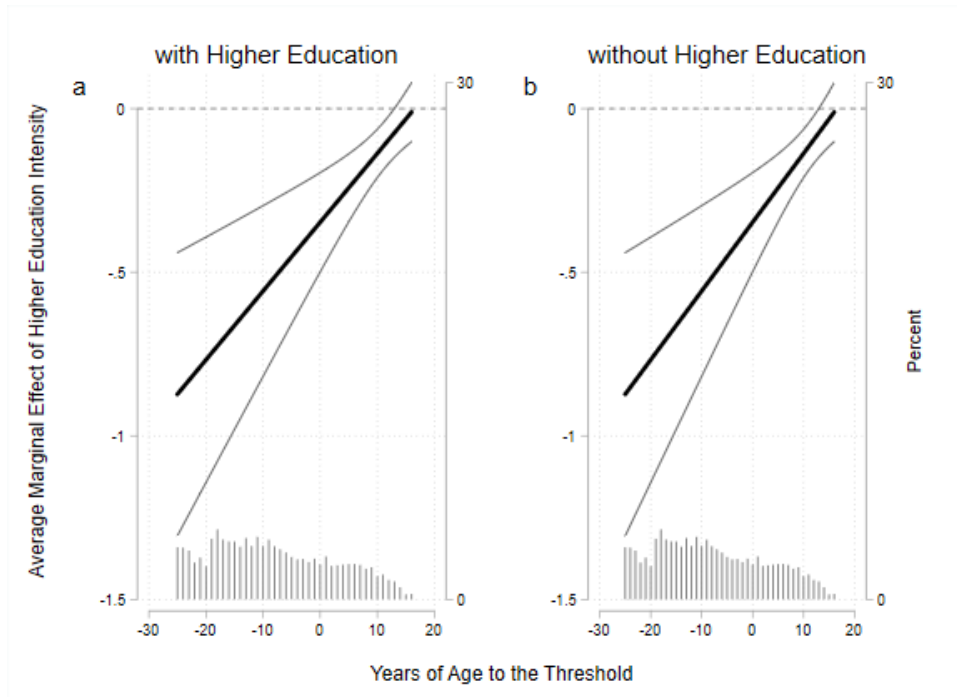
Note: Histogram indicates the observation shares. The marginal effects are shown with 95 percent CI.

Figure S.5: Marginal Effects of Higher Education Intensity on Diffuse Support for Autocracy
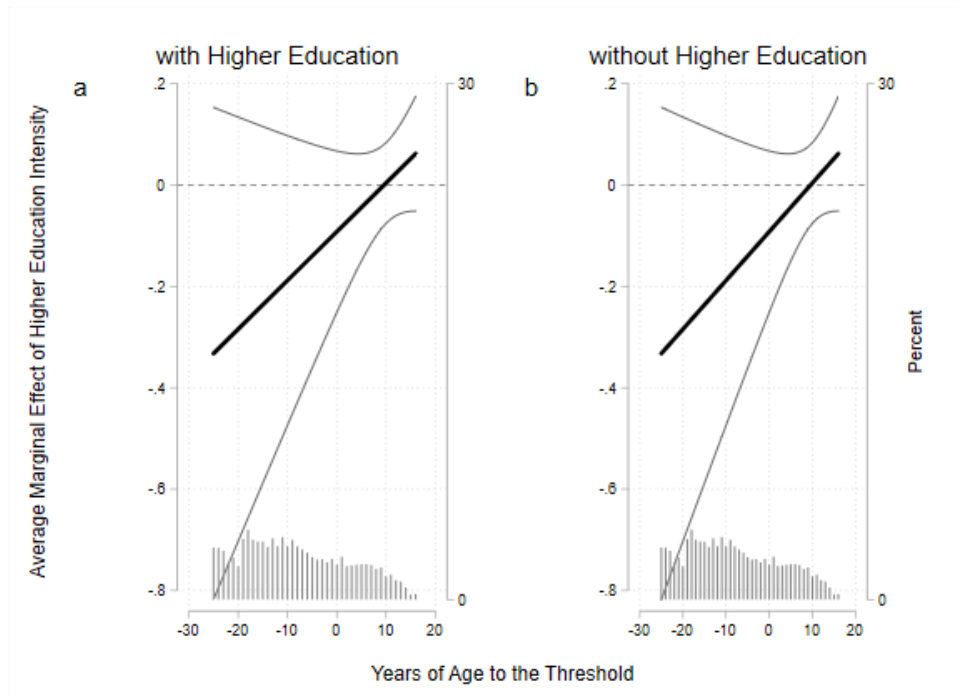
Note: The histogram shows the observation shares. The marginal effects are shown with 95 percent CI.

Table S.5: OLS and Ordered Logistic Regressions of Traditional Gender-role Attitudes

	(1) OLS	(2) Ordered Logistic
Higher education	-0.476***	
	(0.067)	
Years of age to the threshold	-0.042***	-0.035***
	(0.004)	(0.004)
Higher education intensity	0.200***	0.153***
	(0.054)	(0.045)
Years of age to the threshold× Higher education intensity	-0.015***	-0.011**
	(0.004)	(0.004)
Female	-0.667***	-0.522***
	(0.043)	(0.037)
N. of daughters	0.228***	0.169***
	(0.036)	(0.031)
N. of sons	0.304***	0.248***
	(0.039)	(0.033)
Employed	-0.309***	-0.193***
	(0.053)	(0.045)
Rural hukou	0.553***	0.491***
	(0.047)	(0.038)
Religious	0.067	0.121*
	(0.068)	(0.058)
Communist party membership	-0.071	-0.104**
	(0.045)	(0.038)
Mongolian	-0.186	-0.018
	(0.388)	(0.322)
Manchu	-0.061	0.164
	(0.244)	(0.210)
Tibetan	-0.840	-1.112
	(1.081)	(0.914)
Uyghurs	0.430	0.372
	(0.318)	(0.288)
Other ethnic groups	0.144[+]	0.128[+]
	(0.081)	(0.070)
Prob > χ^2	0	0
Observations	13601	13609

Standard errors in parentheses
[+] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure S.6: Marginal Effect of Higher Education Intensity on Attitudes toward Traditional Gender Roles
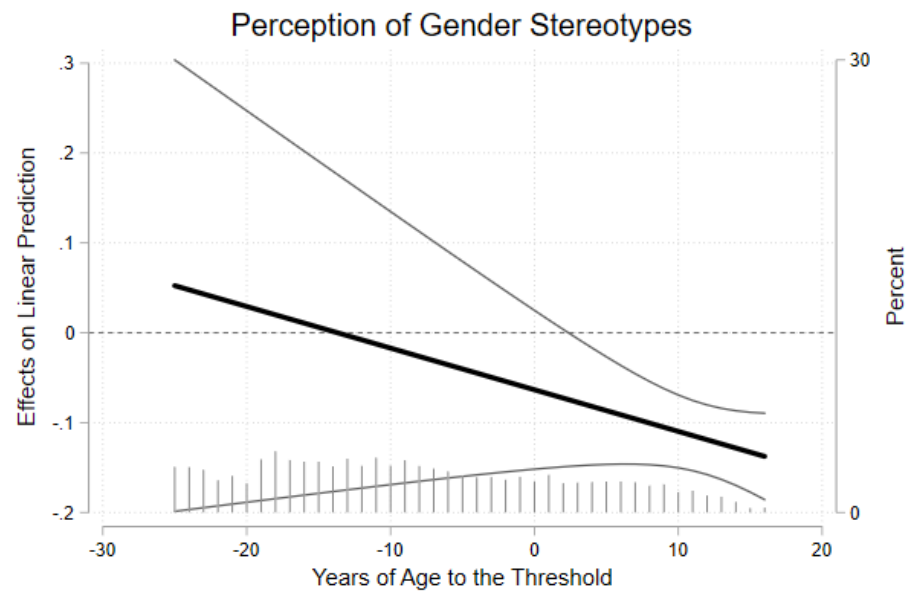
Note: The histogram shows the observation shares. The marginal effects are shown with 95 percent CI.

Figure S.7: Marginal Effects of Higher Education Intensity on Attitudes toward Traditional Gender Roles (Comparing Between with and without Higher Education)

Note: Histogram indicates the observation shares. The marginal effects are shown with 95 percent CI.

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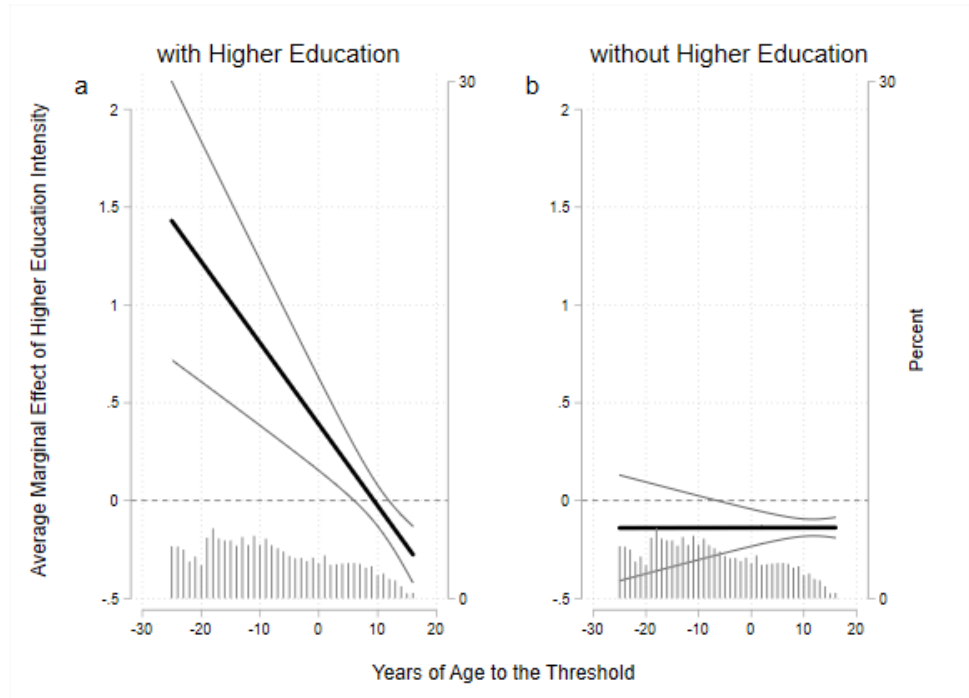
3.2 Using Categorical Operationalization

Figure S.8: Marginal Effects of Higher Education Intensity on Attitudes toward Traditional Gender Roles (Comparing Between with and without Higher Education)
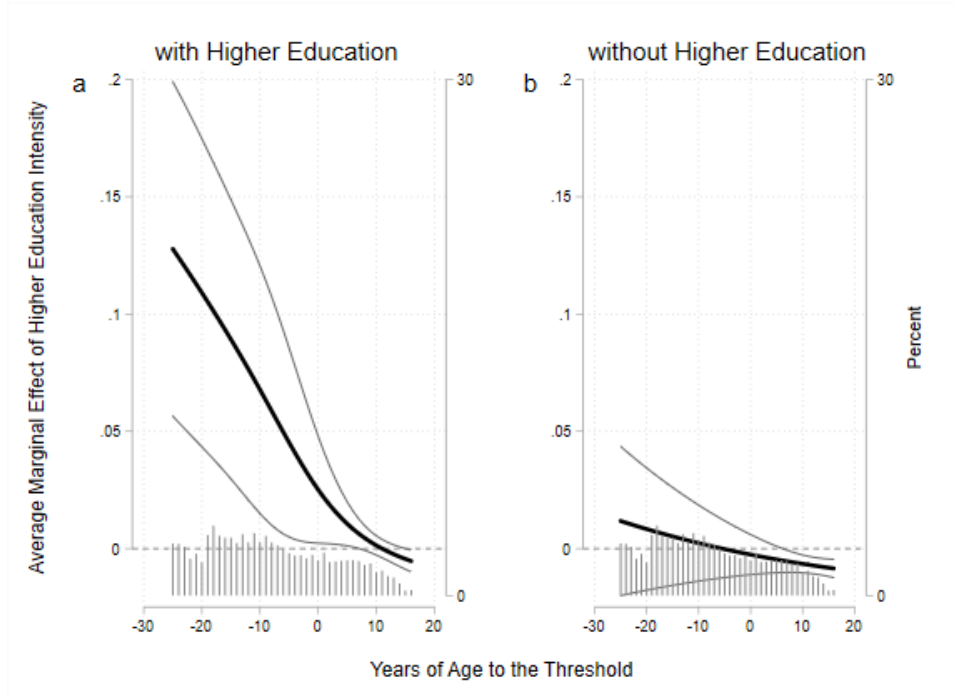
Note: Histogram indicates the observation shares. The marginal effects are shown with 95 percent CI.

3.3 Using 2SLS IV Estimation on Authoritarian Support

Table S.6: 2SLS IV Estimation on Specific Support and Diffuse Support for Autocracy

	Specific Support		Diffuse Support	
	(1) 1st Stage	(2) 2nd Stage	(3) 1st Stage	(4) 2nd Stage
Higher education		-5.468***		-0.475
		(1.050)		(0.688)
Younger cohort	0.020		0.044*	
	(0.021)		(0.020)	
Higher education intensity	0.203***		0.208***	
	(0.033)		(0.029)	
Younger cohort X Higher education intensity	-0.206***		-0.224***	
	(0.032)		(0.029)	
Perception of gender stereotypes	-0.003$^+$	0.069***	-0.001	0.010
	(0.001)	(0.015)	(0.001)	(0.011)
Perception of social trust	0.009*	0.245***	0.008**	-0.070*
	(0.004)	(0.043)	(0.003)	(0.028)
Perception of social equality	0.005	0.536***	-0.005	0.168***
	(0.004)	(0.041)	(0.003)	(0.029)
Happiness level	0.002	0.304***	-0.001	0.054
	(0.005)	(0.050)	(0.004)	(0.034)
Female	0.016*	0.372***	0.001	0.059
	(0.008)	(0.081)	(0.006)	(0.054)
Religious	-0.009	-0.137	-0.011	-0.005
	(0.010)	(0.115)	(0.010)	(0.092)
Communist	-0.147***	-0.874***	0.108***	0.182
	(0.014)	(0.189)	(0.015)	(0.111)
Rural	-0.070***	-0.193$^+$	-0.081***	0.227**
	(0.008)	(0.104)	(0.008)	(0.084)
Other individual controls	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
N	5351	5351	6316	6316
Kleibergen-Paap F stat		33.534		46.099
Kleibergen-Paap LM Test p-value		0.000		0.000

Robust standard errors in parentheses.
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.4 Using Age Cohort (on Authoritarian Support)

Table S.7: Ordered Logistic Regressions of Specific and Diffuse Support for Autocracy

	Specific Support		Diffuse Support	
	Simple	Interaction	Simple	Interaction
Younger cohort		0.238+		0.266
		(0.143)		(0.166)
Higher education intensity		-1.325***		0.272
		(0.266)		(0.296)
Younger cohort X Higher education intensity		1.267***		-0.272
		(0.269)		(0.303)
Perception of gender stereotype	0.068***	0.071***	0.028+	0.034*
	(0.013)	(0.013)	(0.015)	(0.015)
Perception of social trust	0.125***	0.114**	-0.090*	-0.087*
	(0.035)	(0.037)	(0.036)	(0.038)
Perception of social equality	0.368***	0.337***	0.095*	0.098*
	(0.035)	(0.037)	(0.038)	(0.039)
Happiness level	0.246***	0.245***	0.013	0.020
	(0.043)	(0.045)	(0.047)	(0.050)
Female	0.080	0.153*	0.093	0.075
	(0.065)	(0.070)	(0.075)	(0.080)
Primary school	0.114	0.209	-0.001	-0.007
	(0.118)	(0.131)	(0.128)	(0.141)
Secondary education	-0.042	0.098	0.007	-0.001
	(0.116)	(0.130)	(0.129)	(0.142)
Tertiary vocational college	-0.463**	-0.298	-0.182	-0.199
	(0.170)	(0.186)	(0.195)	(0.210)
Bachelor	-0.448**	-0.225	-0.719***	-0.740***
	(0.173)	(0.190)	(0.205)	(0.222)
Master and above	-0.562	-0.478	-1.893***	-1.939***
	(0.487)	(0.502)	(0.551)	(0.575)
Religious	-0.225*	-0.247*	0.066	0.132
	(0.100)	(0.104)	(0.119)	(0.125)
Communist party member	-0.076	-0.090	0.227+	0.244+
	(0.091)	(0.096)	(0.123)	(0.130)
Rural hukou	0.005	0.092	0.280**	0.248*
	(0.069)	(0.074)	(0.091)	(0.098)
Logged household income	-0.151***	-0.150***	-0.126**	-0.168***
	(0.035)	(0.037)	(0.043)	(0.046)
Other controls	Yes	Yes	Yes	Yes
Observations	4431	4006	5834	5244

Standard errors in parentheses
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.5 Using 19-year-old as Threshold for the 2SLS IV Estimation

Table S.8: 2SLS IV Estimation on Traditional Gender Roles (19 as Age Threshold)

	Baseline Model		Full Model	
	(1)	(2)	(3)	(4)
Higher education		-5.489***		-4.932***
		(0.318)		(0.621)
Younger cohort	0.058***		0.056***	
	(0.009)		(0.010)	
Higher education intensity	0.240***		0.090***	
	(0.021)		(0.024)	
Younger cohort × Higher education intensity	-0.229***		-0.083***	
	(0.022)		(0.024)	
Female			0.005	-0.633***
			(0.006)	(0.050)
N. of daughters			-0.044***	0.076
			(0.004)	(0.054)
N. of sons			-0.057***	0.124+
			(0.004)	(0.064)
Employed			0.021**	-0.124*
			(0.006)	(0.060)
Rural hukou			-0.203***	-0.381**
			(0.007)	(0.133)
Religious			-0.020**	-0.027
			(0.008)	(0.080)
Communist party membership			0.029***	0.074
			(0.006)	(0.055)
Mongolian			0.055	0.016
			(0.057)	(0.504)
Manchu			-0.033	-0.192
			(0.032)	(0.284)
Tibetan			0.230	0.139
			(0.198)	(1.146)
Uyghurs			-0.087*	-0.041
			(0.034)	(0.474)
Other ethnic groups			-0.009	-0.001
			(0.008)	(0.089)
N	17430	17430	13223	13223
Kleibergen-Paap F stat		261		78
Kleibergen-Paap LM Test p-value		0		0

Robust standard errors in parentheses.

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

3.6 Adding Provincial Fixed Effects in the 2SLS IV Estimation

Table S.9: 2SLS IV Estimation on Traditional Gender Roles (with Provincial Fixed Effect)

	Baseline Model		Full Model	
	(1)	(2)	(3)	(4)
Higher education		-6.695***		-5.865***
		(0.405)		(0.691)
Younger cohort	0.045***		0.041**	
	(0.012)		(0.013)	
Higher education intensity	0.179***		0.112***	
	(0.029)		(0.032)	
Younger cohort × Higher education intensity	-0.159***		-0.100**	
	(0.028)		(0.031)	
Female			0.000	-0.644***
			(0.006)	(0.053)
N. of daughters			-0.039***	0.067
			(0.004)	(0.056)
N. of sons			-0.051***	0.086
			(0.004)	(0.069)
Employed			0.017**	-0.184**
			(0.006)	(0.062)
Rural hukou			-0.169***	-0.239+
			(0.007)	(0.125)
Religious			-0.032***	-0.116
			(0.008)	(0.092)
Communist party membership			0.029***	0.126*
			(0.006)	(0.059)
Mongolian			0.053	0.236
			(0.056)	(0.511)
Manchu			-0.019	-0.147
			(0.032)	(0.293)
Tibetan			0.094	-0.244
			(0.224)	(1.226)
Uyghurs			0.198**	4.525***
			(0.074)	(0.925)
Provincial fixed effect	Yes	Yes	Yes	Yes
N	17361	17361	13166	13166
Kleibergen-Paap F stat		180		69
Kleibergen-Paap LM Test p-value		0		0

Robust standard errors in parentheses.

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

3.7 Effect of Higher Education on Traditional Gender Role Attitudes around Age Threshold in Bandwidths of Age Cohorts (Full Models with Controls)

Figure S.9: Effect of Higher Education on Traditional Gender Role Attitudes around Age Threshold in Bandwidths of Age Cohorts (Full Models with Controls)
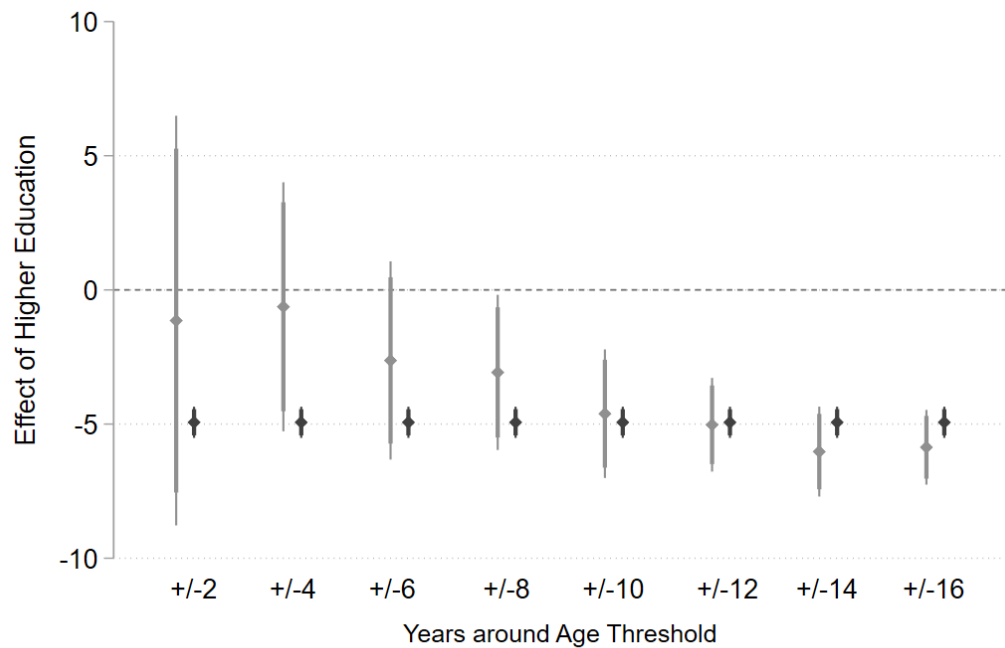
Note: This figure demonstrates the effect of higher education on traditional gender role attitudes using data around different age thresholds based on the IV-2SLS models. Each circle indicates a point estimate, and the vertical bars are the 95 and 90 percent confidence intervals. The darker bars are based on full models excluding Beijing, Tianjin, and Shanghai where higher education was highly concentrated already before the reform. The lighter bars are based on full models without such exclusion.

3.8 Excluding Potential Post-treatment Variables

Table S.10: Ordered Logistic Regressions of Specific and Diffuse Support for Autocracy

	Specific Support		Diffuse Support	
	(1) Simple	(2) Interaction	(3) Simple	(4) Interaction
Years of age to the threshold		0.001		0.008
		(0.004)		(0.006)
University intensity		-0.281***		-0.020
		(0.070)		(0.105)
Years of age to the threshold × University intensity		0.020***		0.006
		(0.005)		(0.009)
Female	-0.005	0.113[+]	0.055	0.092
	(0.051)	(0.059)	(0.062)	(0.072)
Primary school	-0.049	0.079	-0.026	-0.021
	(0.094)	(0.110)	(0.113)	(0.132)
Secondary education	-0.311***	-0.080	-0.057	-0.070
	(0.092)	(0.111)	(0.111)	(0.133)
Tertiary vocational college	-0.591***	-0.345*	-0.349*	-0.353[+]
	(0.129)	(0.153)	(0.159)	(0.187)
Bachelor	-0.541***	-0.270[+]	-0.960***	-0.833***
	(0.132)	(0.159)	(0.166)	(0.199)
Master and above	-0.753**	-0.304	-1.734***	-2.027***
	(0.253)	(0.298)	(0.294)	(0.387)
Religious	-0.105	-0.137	0.030	0.075
	(0.077)	(0.087)	(0.101)	(0.113)
Communist party member	-0.124[+]	-0.083	0.109	0.143
	(0.068)	(0.079)	(0.096)	(0.111)
Rural Hukou	0.055	0.149*	0.199**	0.149[+]
	(0.053)	(0.062)	(0.073)	(0.087)
Logged household income	-0.167***	-0.170***	-0.158***	-0.172***
	(0.027)	(0.031)	(0.036)	(0.042)
Other controls	Yes	Yes	Yes	Yes
AIC	12648	9861	9269	7358
BIC	12882	10099	9500	7602
Prob > χ^2	0	0	0	0
Observations	7084	5517	8109	6466

Standard errors in parentheses
[+] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure S.10: Marginal Effects of Higher Education Intensity on Specific and Diffuse Support for Autocracy (Based on Models 2 and 4 in Table S.10)
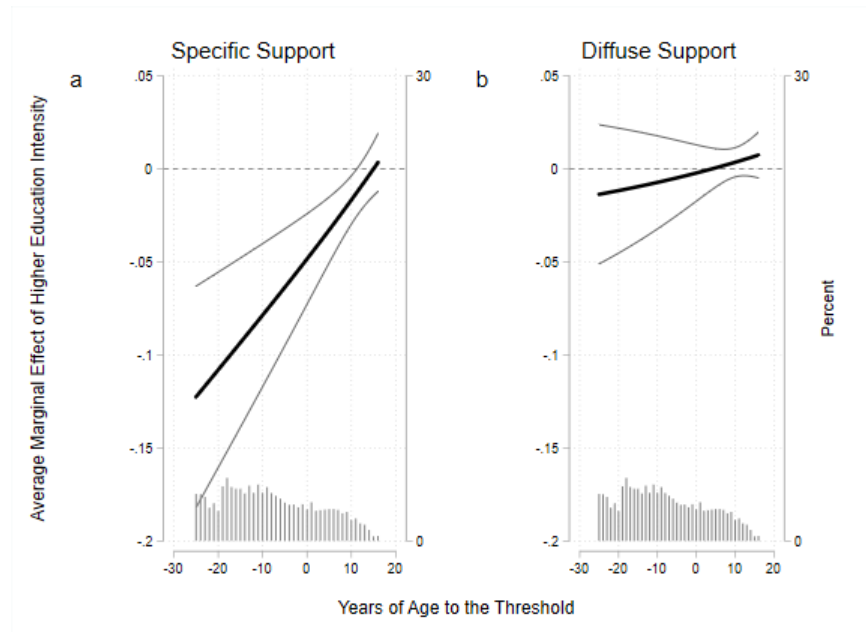
Note: Histogram indicates observation shares. The marginal effects predict the outcomes—high levels of specific and diffuse support for autocracy. The marginal effects are shown with 95 percent confidence intervals and are based on Models 2 and 4.

Figure S.11: Marginal Effects of Higher Education Intensity on Specific Support for Autocracy (With and Without Higher Education)
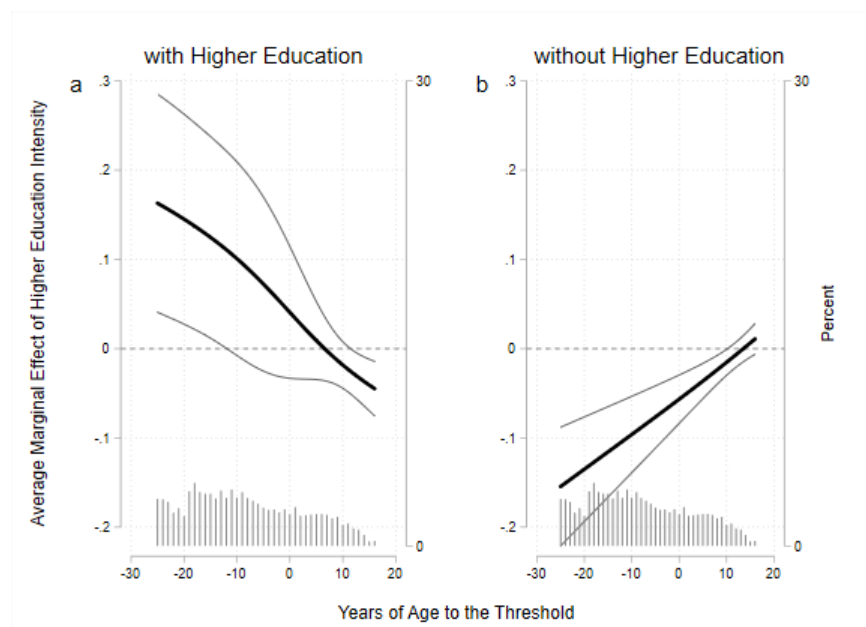
Note: Histogram indicates observed shares. The marginal effect predicts the outcome—a high level of specific support for autocracy. The marginal effects are shown with 95 percent confidence intervals and are based on Model 2.

Paper 2

The Effects of Gender Quotas on Substantive Representation: Evidence from Taiwan

The Effects of Gender Quotas on Substantive Representation: Evidence from Taiwan[*]

Suen Wang

Abstract

Although studies show that the increasing number of women in a legislature leads to a greater representation of social policies, it is often unclear if the related effect is significant for both quota and non-quota women. This paper leverages the case of Taiwan, where quotas are implemented on one tier in a mixed electoral system. We compiled a dataset over 20 years to investigate how quotas affect the initiation and passage of legislation for welfare, health, and education issues. Using an extended difference-in-differences approach, we find that while quotas influence quota women profoundly in initiating welfare and health issues, a related pattern could not be observed for non-quota women. Using an instrumental variable approach, we find that quotas increase the probability for both quota and non-quota women to enact legislation for welfare, education, and health issues. Moreover, the findings reveal no hindering effect of quotas on these issues for elected men.

Introduction

In the past two decades, gender quotas have been implemented worldwide in representative democracies. Over 130 countries have introduced some sort of gender quota, in the form of legislative candidate quotas, reserved seats, or voluntary party quotas (IDEA, 2019). Existing research on gender quotas has centered on explaining the outcomes, such as the qualifications of politicians (Rickne, Besley, Folke, & Persson, 2017; Weeks & Baldez, 2014), women's political leadership (O'Brien & Rickne, 2016), women's political careers (Folke & Rickne, 2016; Y. Kerevel, 2019), gender bias reduction (Pande, Topalova, Chattopadhyay, Duflo, & Beaman, 2009), and voter turnout (Bucci et al., 2012).

Despite the plethora of studies investigating the impact of gender quotas, their effect on social policy making is largely underexplored. Although the literature reveals that women legislators focus on social policy issues more than their male counterparts do (Schwindt-Bayer, 2006), little is known about the empirical validity of this proposition restricted to women who are elected via quota laws (quota women). This paper examines the implementation of gender quotas on the proportional representation (PR) tier in Taiwan's mixed electoral system to distinguish between the effects of quotas for quota and non-quota women. Do gender quotas motivate quota women to initiate and enact legislation regarding social policy issues? Does the related quota effect hold for non-quota women? Furthermore, do quotas trigger a hindering effect on these women-oriented issues from elected men who are electorally affected by the implementation of quotas?

The early gender and politics literature provides a comprehensive conceptualization of representation (Pitkin, 1967).[1] Previous studies suggest a descriptive-substantive link, implying that gender quotas and the increase in descriptive representation (number of women legislators) are likely to translate into substantive representation (to promote women's issues in parliament) (Dahlerup, 1988; Phillips, 1995). We refer to this argument as the presence

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[1]Pitkin's seminal study (1967) identified four dimensions of representation: *formal representation*, referring to how a representative is selected; *symbolic representation*, referring to the way a representative stands for the represented; and *descriptive representation* and *substantive representation*, referring to the similarity and congruence between representative and the represented.

argument.

Although the presence argument is of great theoretical interest, a few caveats should be noted. Theoretically, the notion of women's substantive representation is primarily based on the implicit assumption that women represent women's interests. Specifically, being quota women is largely confounded with being women legislators. Empirically, often, studies that apply the presence argument do not further differentiate the stages of legislative initiation and legislative outcome. Moreover, although the existing body of research focuses on the positive quota effect, little is known about whether implementing quotas will negatively influence women's substantive representation (which we refer to as the quota-hindering argument). Methodologically, cross-sectional research on quotas and representation cannot account for context-specific characteristics. The idea of women's substantive representation hinges on shared experiences among women that cultivate a sense of common social and political interests (Beckwith & Cowell-Meyers, 2007). Women's experiences, therefore, vary substantially from context to context. In addition, endogeneity in the form of reverse causality can be a significant concern. Although studies have revealed that politicians often strategically adopt gender quotas to gain electoral support from female voters (Perrigo, 1996) and strengthen control over party representatives (Goetz & Hassim, 2003), one of the apparent drivers for introducing legislative gender quotas might be to increase the substantive representation of women in legislative bodies. The causal direction might, therefore, go both ways.

This paper addresses these challenges. Theoretically, it proposes a mechanism building on the quota presence argument while accounting for formal representation. Empirically, the paper aims to overcome the methodological limitations of previous studies and provide a new analysis framework for disentangling the effects of the quota between quota and non-quota women, as well as between men elected to the quota and non-quota tiers. The study leverages the case of Taiwan, a new democracy with a mixed electoral system, where an exogenous assignment of a 50–50 zipper system was implemented on the PR tier. We discerned four groups of legislators: quota women, non-quota women, men elected to the quota tier, and

men elected to the non-quota tier. This approach allows us to empirically test our theoretical models through an interaction between gender, quota tier, and post-quota period, while holding the unobserved context-specific characteristics constant. Distinguishing between groups of legislators generated the opportunity to assess systematically a dynamic, overall quota mechanism.

This paper focuses on three major social policy areas: health, welfare, and education. Past studies have revealed that women often pay greater attention to these social policy issues than their male colleagues do. For instance, Schwindt-Bayer (2006) finds that female legislators are significantly likely to initiate bills on education, health, and welfare issues in Latin America.[2] Drawing on the case of India, Clots-Figueras (2012) finds that education and health are woman-preferred social policies. The evidence is equally compelling for advanced democracies: Bratton and Ray (2002), for example, find that the number of female legislators is positively related to the provision of child care in Norway.

Our findings contribute to the existing studies on quotas and social policy making. First, at the legislation-initiation stage, the results reveal that gender quotas motivate quota women most profoundly. Quota women significantly introduce welfare and education issues at a greater rate than other groups of legislators do. However, a related effect does not hold for non-quota women when comparing women and men on the non-quota tier. Moreover, after the quota introduction, no hindering effect on these issues could be observed from the men electorally affected by the quota. Second, analysis of legislative passage shows that quotas increase the probabilities for both quota and non-quota women to get these initiated social policy bills further enacted into law. The paper produces novel insights by showing that formal representation (i.e., how women are elected) matters for the quota effect. Although quotas have the strongest effect on the ability of quota women to initiate social policy issues, a related pattern does not hold for non-quota women. As such, this research has important implications for understanding the underlying dynamic of the effect of quotas in the legislative process by assessing the interplay between gender and quota tier.

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[2]In contrast, Schwindt-Bayer (2006) shows that women are significantly less likely to initiate issues relating to the economy, agriculture, and fiscal affairs.

Theories and Hypotheses

The Presence Argument

In this section, we lay out the theoretical aspects motivating our empirical models. Early feminist theory on the politics of presence (Phillips, 1995) suggests a descriptive-substantive link, indicating that women's substantive representation is related to their political presence. This theory builds on the shared experiences of women in the elected assemblies, which composes their distinctive values and policy priorities on issues such as education, health care, and social welfare. This theoretical framework acknowledges that gender quotas and the considerable increase in the legislative presence of women have a substantial impact on women's policy priorities. A significant body of literature has found strong empirical evidence supporting the descriptive-substantive link (Bratton & Ray, 2002; Clayton, Josefsson, Mattes, & Mozaffar, 2019; Franceschet & Piscopo, 2008; Schwindt-Bayer, 2006; Volden, Wiseman, & Wittmer, 2018). Several studies (Franceschet & Piscopo, 2008; Volden et al., 2018) further disaggregate substantive representation in two stages: legislative initiation and legislative outcome. However, the findings in these two stages do not concur well. Franceschet and Piscopo (2008) and Volden et al. (2018) show that despite women tending to introduce more women-oriented bills, they typically do not succeed in getting them enacted into law. The arguments so far suggest that one should generally expect a descriptive-substantive link, that is, a positive relationship between the descriptive and substantive representation of women. Moreover, the disaggregation of substantive representation affects these relationships. The increasing proportion of female legislators could facilitate the growing number of bills on social policy issues, but it might not necessarily lead to the legislative success of these bills.

Our point of departure is that there is no clear theoretical expectation accounting for the variations of formal representation into the descriptive-substantive link. Early theories on the descriptive-substantive link are based on somewhat implicit assumptions that quota and non-quota women are often equally likely to represent women's issues. The arguments made

in this paper challenge these interpretations. The next section summarizes the theoretical claim of a quota mechanism that accommodates gender quotas in the descriptive-substantive link.

The Quota Mechanism

Going beyond the presence argument, we propose accounting for gender quotas—an important form of formal representation—in the descriptive-substantive representation link. As mentioned, formal representation denotes how women are elected. Although a significant body of literature has examined the impact of formal representation on descriptive representation (Schwindt-Bayer & Mishler, 2005), few studies have delved into the role of formal representation in the descriptive-substantive link. Our main expectation, therefore, is that women elected due to quotas are more likely to introduce and enact women-oriented social policy issues than is the case with other legislators.

However, one may challenge whether quotas can reduce the representation of women's policy concerns. For instance, quota allocation can facilitate a label effect that stigmatizes quota legislators, reducing the likelihood that they will pursue feminist policies (Krook & Schwindt-Bayer, 2012). Consequently, quota women may disengage from advancing women's issues later in the legislative stage to indicate that they are serious legislators (Childs, 2004). Moreover, issues raised by quota women might be generally vulnerable to stigmatization in the legislature. For instance, quota women are less recognized in plenary debates than are legislators elected to open seats (Clayton, Josefsson, & Wang, 2014). Irrespective of this and more positively, however, there is reason to believe that quotas can increase the representation of historically female policy areas. On the macro level, as Clayton and Zetterberg (2018) show, quotas increase government spending on public health worldwide. On the subnational level, based on a natural experiment in India, Chattopadhyay and Duflo (2004) find that quota women make policy choices in line with women's concerns. Through rich qualitative analysis of women legislators, Franceschet and Piscopo (2008) have first conceptualized a quota-mandate effect, arguing that quota women may show a mandate to

act on behalf of women. In general, despite the countervailing arguments, existing studies have accumulated crucial evidence that sheds light on the strong obligation that quota women might perceive to represent women's interests.

Although Franceschet and Piscopo (2008) theorize the interplay between quotas and women's substantive representation, in the words of Childs and Krook (2012), their empirical analysis is "not able to distinguish between quota and non-quota women" because most countries with single electoral systems have adopted legal quotas, which often apply to all candidates. Indeed, surprisingly, theories linking quotas and substantive representation have hardly featured in distinguishing between quota and non-quota women. As Catalano Weeks (2018) argues, however, the quota/non-quota women distinction is not trivial. Importantly, the nature of the quota implementation in the Taiwanese case provides the opportunity to examine whether a quota mandate drives the social policy legislation. Based on these arguments, one might expect quota women to be more likely to act on women's policy interests. Gender quotas should, therefore, have a mandate effect on quota women to introduce and enact social policy issues. Hypotheses 1a and 1b summarize these expectations regarding a quota-mandate effect on social policy legislation.

Hypothesis 1a Quota-mandate effect (legislative initiation):
Gender quotas increase the probability that quota women introduce welfare, health, and education bills at a higher rate than do non-quota women, men elected to the quota tier, and men elected to the non-quota tier.

Hypothesis 1b Quota-mandate effect (legislative outcome):
Gender quotas increase the probability of quota women further enacting welfare, health, and education bills they initiated into law.

In addition to a quota-mandate effect, it is highly relevant to examine whether quotas incentivize non-quota women to represent women's issues. The Taiwanese case of a mixed electoral system (with quotas only being introduced on one electoral tier) provides an opportunity to test the quota effect on non-quota women. The consequent increase in the numerical representation of women has brought the debate about quota implementation to

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the fore. At the heart of this debate lie the implications of introducing quotas on the representation of women in legislative bodies. Studies argue that women might not represent women differently than their male colleagues do. One argument is based on the notion that, regardless of personal traits (e.g., gender, race), legislators are primarily motivated by the interests of their constituency. Another argument is centered on a negative quota effect: With increasing numbers of women in parliament, women might feel a sense of stigma if they advocate for women's issues (Childs & Krook, 2012; Franceschet & Piscopo, 2008). The rationale is that women might be more collaborative on women's issues when there are fewer of them because they do not need to contend with the countervailing opposition of men. Based on the context of state legislatures in the US, studies have forwarded evidence showing correlations between an increase in women's legislative presence and a decline in advocacy for women's issues among female legislators (Reingold, 2000; Thomas, 1991). However, it is plausible that some unobservable factors (e.g., competence, confidence) can explain the unwillingness of women to move these issues forward in the legislative process; in other words, the empirical relationship between increasing women's legislative presence and their deprioritization of women's issues could be spurious.

Indeed, many studies find no or contradictory evidence for the opposing expectations. For instance, Barnes (2012) finds that women exhibit a more distinctive legislative agenda than do male legislators, as they tend to work together to advance social issues impacting women, children, and families. Swers (1998, 2002) reveals that women are more likely to vote together across party lines for issues closely related to women than are their male colleagues. In sum, a growing body of research to date has shown a positive effect of increasing the number of female legislators on women's substantive representation. As the number of women increases in legislative bodies with quota systems, it is crucial to inquire as to whether the quota effect on substantive representation can be observed in non-quota women. To fully grasp the net effect of gender quotas, as we argue in this paper, quotas can also be expected to incentivize non-quota women, more than men elected to the non-quota tier, to represent women's interests.

To motivate such a gender effect on non-quota women, we argue that female legislators are more collaborative as the proportion of women increases following quota implementation. This line of reasoning traces back to the early gender and politics literature (e.g., Dahlerup, 1988; Kanter, 1977), which highlights the importance of a threshold effect. Bratton (2005) has applied a similar idea to different institutional systems and finds that women in legislative bodies with high numbers of women introduce more women-friendly issues than do women in legislative bodies with lower proportions of women. One might, therefore, expect that quotas and the increasing numbers of women legislators may also incentivize non-quota women to exert their preferences. Taken together, the theoretical perspectives discussed thus far lead to the following testable implications:

Hypothesis 2a Gender effect (legislative initiation):
Gender quotas increase the probability that non-quota women introduce welfare, health, and education bills at a higher rate than do men elected to the non-quota tier.

Hypothesis 2b Gender effect (legislative outcome):
Gender quotas increase the probability of non-quota women further enacting welfare, health, and education bills they initiated into law.

Although the quota-mandate and the gender effect may increase the representation of women in welfare, health, and education issues, quota introduction might also countervail a hindering effect on these issues from male legislators electorally influenced by quota implementation. In addition to making it possible to draw a distinction between quota and non-quota women, the case of quotas introduced only on one electoral tier also enables discerning between the male legislators electorally affected by the quota (who are elected to the quota tier) and those unaffected (who are elected to the non-quota tier). This situation generates further opportunity to observe the difference in social policy legislation between male legislators elected to the quota- and non-quota tiers to empirically test whether quota introduction inhibits male legislators elected to the quota tier from initiating women-friendly social policies.

There are several reasons to expect such a hindering effect. As women are winning

representation in legislatures—a traditionally male-dominated environment—in increasing numbers across party lines, the issues that are closer to women's concerns can often be subject to critical examination (Lyn, Clarke, & Fox, 1991). Kanthak and Krause (2012) show that large increases in number of female legislators generate a devaluation of women-preferred issues among the elected men who feel particularly threatened. We argue that men elected to the electoral tier where quotas were introduced might feel particularly intimidated by quotas because they risk losing their seats due to quotas. Consequently, they might avoid sponsoring women's issues, introducing traditional "men's domain" issues instead, such as economic and fiscal affairs (Schwindt-Bayer, 2006; Swers, 2002; Thomas, 1991). Drawing on the preceding argument, we hypothesize the following:

Hypothesis 3 Quota-hindering effect (legislative initiation):

Gender quotas increase the probability that men elected to the quota tier introduce welfare, health, and education bills at lower rates than do men elected to the non-quota tier.

Figure 1: Illustration of Different Groups of Legislators for Purposes of Comparison
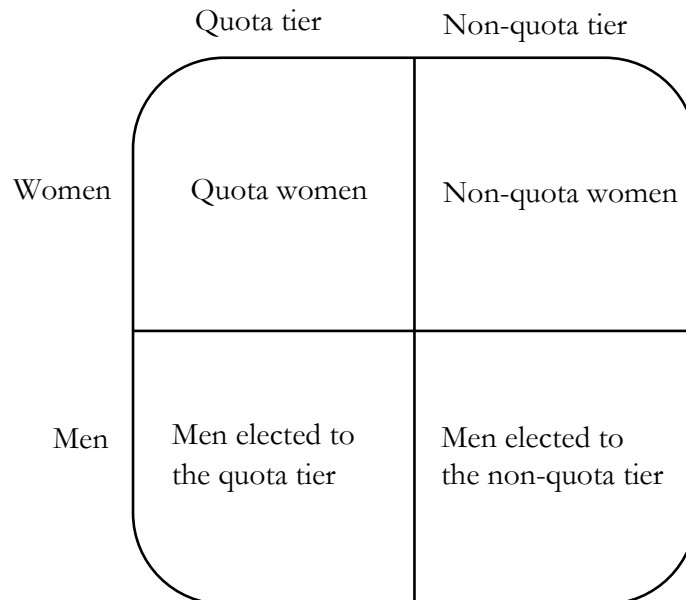
The Case of Taiwan

To keep context-specific factors constant, we draw on a case involving the introduction of quotas in Taiwan, a mixed electoral system democracy.[3] As mentioned, drawing on a case with a mixed system enables us to distinguish legislators based on their gender and elected tier, which allows for empirical testing of our theoretical implications. The mixed system has been a popular institutional choice in established and new democracies. Taiwan's institutional choice mirrors the Japanese mixed electoral system, an influence from the period under Japanese colonial rule (F. N. Batto & Huang, 2016). Unlike the mixed system in Germany, Taiwan's electoral law does not allow a candidate to run for both tiers, which reduces tier contamination. In the 2008 legislative election, Taiwan first introduced a gender quota law to the closed-list PR tier. The motivation to implement gender quotas is driven by the need to compensate for the potential decline in the presence of women following an electoral reform with a large decrease in the district magnitude on the majoritarian tier. Since implementing the quota in 2008, there has been a remarkable increase in the presence of women on the PR tier, where the quota was introduced.[4] Obviously, a large decrease in district magnitude is not the sole motivation driving the implementation of quotas. Since democratization in the 1980s, Taiwan has successfully promoted women in leadership and gender equality. In the 1990s, for instance, Taiwan's major political parties appointed women's movement leaders as policy advisers, cabinet ministers, and election candidates (Fell, 2012), and Taiwan elected its first woman president in 2016.

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[3]There is disagreement in the existing literature as to whether Taiwan's electoral system can be categorized as a mixed system. As Batto (2012) argued, however, the Taiwanese mix of PR and majoritarian components qualifies under both broader and narrower defining criteria of a mixed system, as suggested by Carey and Shugart (1995) and Massicotte and Blais (1999).

[4]Appendix Figure S.1 shows that the proportion of female legislators increased by 20% on the PR tier after the quota was introduced.

Table 1: Taiwan's Electoral System before and after the Quota Implementation

	Before the Quota Implementation		After the Quota Implementation	
Tier	Majoritarian	PR	Majoritarian	PR
Electoral rule	SNTV	Closed-list PR	SNTV	Closed-list PR (1/2 gender quota)
Number of seats	168	41	73 (N of districts)	34 (1/2 gender quota)

Note: Information compiled from the Institute for Democracy and Electoral Assistance (IDEA) website (`https://www.idea.int/data-tools/country-view/290/44`) and Democratic Electoral Systems (DES) dataset (Bormann & Golder, 2013). SNTV refers to single non-transferable vote systems.

Table 1 maps out the Taiwanese electoral system before and after the quota implementation. Gender quotas were implemented on the closed-list PR tier. The closed-list PR system is viewed as the most party-centric electoral system (Carey & Shugart, 1995; Norris et al., 2004). Vote-seeking behavior is, therefore, assumed to be less prevalent under the closed-list PR system. In Taiwan's partisan politics, there is a general tendency toward partisan convergence on welfare issues. Here, it is important to note that the center-right Nationalist Party (KMT) and center-left Democratic Progressive Party (DPP) are the two dominant political parties in Taiwan.[5] The transition to democracy in the 1980s opened up electoral competition and changed the incentives for politicians. The two major parties, regardless of their left–right leanings, appeal to the electorate by making social policy promises (Wong, 2003). Consequently, in the Taiwanese case, the party identification of legislators carries little explanatory power for the variation in their social policy priorities (Mares & Carnes, 2009).

One issue must be noted. Gender quotas were embedded in electoral reform. In addition to quota implementation, electoral reform included halving the number of seats on the majoritarian tier, thereby largely increasing inter-party competition. Despite the partisan convergence on welfare issues, after the reform, it became likely that the majoritarian legislators would introduce more social policy issues in response to the increased inter-party competition.[6] Indeed, the welfare state expansion in Taiwan has largely relied on the in-

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[5]The Nationalist government migrated from mainland China to Taiwan after being defeated by the Communists at the end of the 1949 civil war. It ruled Taiwan under martial law and a one-party authoritarian system until Taiwan's democratic transition. Following the third wave of democratization, the first opposition party, DPP (Democratic Progressive Party), was established in Taiwan in 1986.

[6]Studies have found that heightened electoral competition leads to increased education spend-

creasing electoral competition (Mares & Carnes, 2009) because Taiwan has lower levels of unionization. Labor unions are often preoccupied with particularistic interests (Fleckenstein & Lee, 2017). For instance, descriptive evidence indicates a positive correlation between electoral competition and majoritarian candidates campaigning for social policy issues before the 1998 legislative election in Taiwan (Aspalter, 2002). A further example supporting the claim is that Taiwan's center-right KMT party initiated a universal health program—National Health Insurance Act (NHIA)—immediately before the 1995 legislative election, which led to KMT taking many votes away from DPP (Wong, 2003). The heavy focus on social policy issues by major parties in electoral campaigns represents the power of these issues over voters (Fell, 2012).[7]

Figure 2: Average Sponsored Health, Welfare, and Education Bill Share
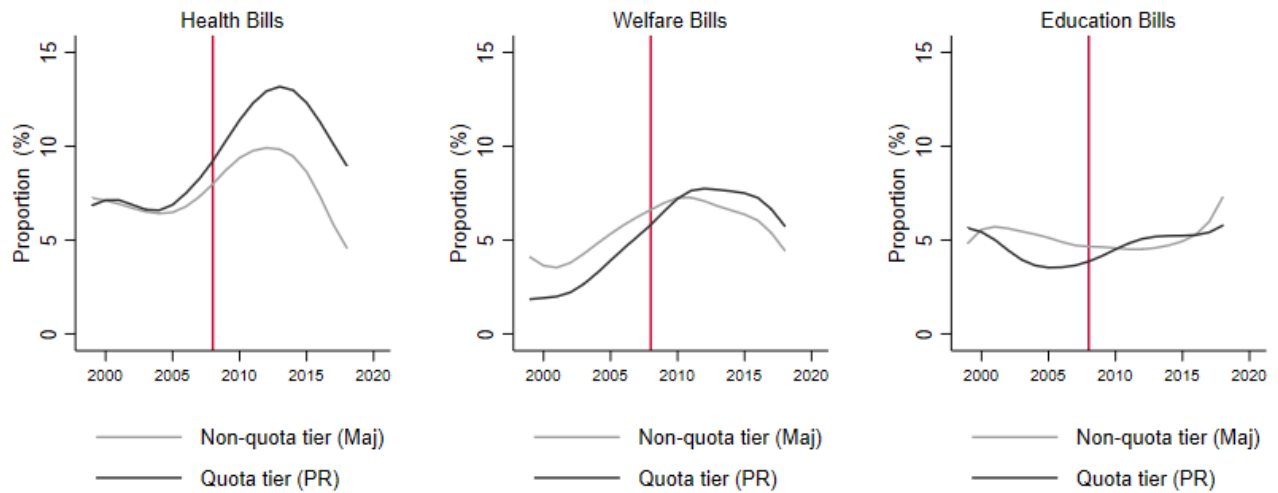
Note: The vertical line represents the year 2008, when quotas first implemented. The smooth lines are fitted by the locally weighted smoothing (LOESS).

One issue that naturally arises is the difficulty to disentangle the legislative behavior driven by quotas from that driven by the decrease in the district magnitude. This paper acknowledges the difficulty in isolating the quota effect and seeks to address it from two

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ing in Mexico (Hecock, 2006). Avelino, Brown, and Hunter (2005) found a positive relationship between electoral competition and social spending in Latin America.

[7]As Fell (2012) attests, this can be exemplified by an anecdote involving an emotional appeal in a KMT political TV ad showing "a baby undergoing a heart operation. Then the doctor explains how, before UHIA, many parents were unable to afford such operations and thus lost their children" (p. 237).

perspectives. First, as seen in Figure 2, the observed average bill shares present roughly parallel trends in the pre-quota period. Moreover, the average bill share for each social policy issue for legislators elected to the PR tier increased largely. However, it did not increase unusually for legislators elected to the majoritarian tier after the district magnitude decline on the same tier. This implies that, based on the observable average, one cannot identify legislators elected to the majoritarian tier who are more subject to introducing social policy issues in the constituency's interest after the district magnitude decline. Second, we use a case selection strategy to overcome the issue. In practice, majoritarian legislators (on the non-quota tier) could introduce more social policy issues than PR legislators (on the quota tier) for vote seeking, particularly after the seat cuts. In this case, comparing between the quota and non-quota tiers,[8] it would be less likely to observe a quota effect on introducing social policy issues. If we could observe a significant quota effect from such a less likely case, later on, it would provide evidence that any observed quota effect is not completely driven by the difference in the electoral formula. This point will be further elaborated in the findings section (Table 3).

Data

We assembled a dataset, which was retrieved from Taiwan's legislative records. The legislative records consist of detailed information from bill initiation to bill passage for the last 20 years. The data was coded on the individual-legislator level and is aggregated annually, which covers the 1999–2018 period across three legislative terms, both pre- and post-quota implementation.[9] We also relied on anecdotes from online newspapers for coding any change in legislators' party identification during a term.[10]

The operationalization of health, welfare, and education bills is based on the policy coding classification developed by Baumgartner and Jones (2002). A recent study by Volden

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[8]This comparison is analyzed in Table 3.

[9]In total, the data covers six legislative terms.

[10]Appendix Table S.1 presents a detailed variable definition and sources for constructing the variables.

et al. (2018) draws on the same coding classification to examine women's legislative behavior. Appendix Tables S.2 and S.3 provide a detailed account of the subcategories for each issue, as well as the time period for each observation.[11] It is worth noting that the last legislative session of each year usually extends two weeks into the next year. To avoid invoking serial correlation—legislative behavior at the beginning of the year explains the previous year— and to be consistent with each session, we coded bills in the first two weeks of the year as in the previous year. Because our theoretical arguments distinguish between legislative initiation and legislative outcome, we explore two sets of dependent variables. To test the initiation hypothesis, the first set of dependent variables includes the bill main-sponsorship, which measures whether one has sponsored health, social welfare, and education issues as a main sponsor and the share of those bill main-sponsorships for each legislator in a given year. Sponsorship measurement error occurs if legislators introduce social policy issues because they are active and introduce significant numbers of bills on all issues regardless of topic. We draw on the share of the sponsored bills instead of the number of sponsored bills to overcome measurement error. To test the outcome hypothesis, we further tracked the fate of those bill main-sponsorships. The second set of dependent variables thus captures the number of initiated health, social welfare, and education bills that were enacted into law for each legislator in a given year. It should be noted that the data collection did not include legislators who served as either president or vice-president of the legislature, because they could be considered outliers who advance very few sponsorships.

Following the previous studies (Schwindt-Bayer, 2006; Volden, Wiseman, & Wittmer, 2013; Volden et al., 2018), we constructed legislator characteristics as relevant control variables to isolate the effect of quota implementation on legislative behavior. These controls consist of their party identification, the majority party, seniority, age, and committee membership.[12] The information was obtained from the social-demographic attributes of legisla-

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[11]The data excluded the last two sessions of the ninth legislature because those sessions were still taking place at the time of data collection.

[12]The appendix provides a detailed description of variables (Table S.1), as well as summary statistics (Table S.4 and Table S.5). Note that there is no health care committee in Taiwan's legislature.

tors from the legislative records. The majority party is a binary variable indicating whether the legislator is a member of the majority party, which is considered highly relevant for the advancement of their legislative agenda (Volden et al., 2013). Seniority is a relevant control that considers years of experience served as a legislator. Quota legislators might generally have fewer years of experience, which relates to their ability to advance their policy agenda. It is important to control for the committee membership variables to avoid overestimating the quota effect because it is reasonable to expect that legislators assigned to the education or social welfare committee are more likely to work on education, health, and welfare issues. Education is a dummy variable indicating whether a legislator has PhD. Ideally, we would want to control for characteristics of electoral districts (e.g., GDP and unemployment rate at the district level). Including these controls could be problematic in the mixed system setting. Given that these controls are related to the primary variable of interest, quota tier, including these variables would result in a multicollinearity problem.

Empirical Analyses and Results

Quota and Legislative Initiation on Social Policy Issues

To tap into the quota effect on legislative initiation, we first consider a set of logistic regression models with marginal effects. The central explanatory variable is the interaction effect of legislator type and post-quota period, which tests whether quota women, non-quota women, and men elected to the quota tier are more or less likely to introduce welfare, health, and education issues than are men elected to the non-quota tier (baseline group) since the quota was introduced. Table 2 presents the main findings. The different specifications include the baseline logistic regressions and regressions with controls. To ease the interpretation of the interaction, in Figure 3, we further employ marginal effects after the logistic models. The marginal effects indicate the change of legislative initiation behavior when the time shifts from the pre- to post-quota period. The marginal effects allow for interpreting the average pre-post difference in legislative behavior for each legislator group.

Table 2: Logistic Regressions of Initiating Social Policy Issues

	Welfare		Health		Education	
	(1)	(2)	(3)	(4)	(5)	(6)
Quota women	0.514	-0.021	0.570	-0.031	0.044	-0.423
	(0.363)	(0.371)	(0.370)	(0.383)	(0.397)	(0.507)
Men elected to the quota tier	-0.929***	-1.172***	-0.668**	-1.029***	-0.534*	-0.799*
	(0.275)	(0.326)	(0.212)	(0.302)	(0.223)	(0.330)
Non-quota women	1.176***	1.121***	0.906***	0.778***	1.347***	1.043***
	(0.177)	(0.196)	(0.170)	(0.202)	(0.187)	(0.198)
Post	1.780***	2.199***	1.535***	0.481	1.220***	2.028***
	(0.144)	(0.326)	(0.135)	(0.293)	(0.139)	(0.292)
Quota women × post	0.208	0.198	0.121	-0.041	0.767+	0.754+
	(0.435)	(0.408)	(0.438)	(0.401)	(0.421)	(0.454)
Men elected to the quota tier × post	0.401	0.343	0.816*	0.723*	0.384	0.422
	(0.348)	(0.353)	(0.348)	(0.356)	(0.319)	(0.318)
Non-quota women × post	-0.703**	-0.843**	-0.337	-0.530*	-0.403	-0.198
	(0.257)	(0.277)	(0.242)	(0.257)	(0.292)	(0.295)
DPP		-0.544***		-0.279*		-0.324*
		(0.136)		(0.129)		(0.134)
PFP		-0.209		-0.052		-0.273
		(0.214)		(0.212)		(0.208)
Other parties		0.401		0.034		0.164
		(0.310)		(0.275)		(0.266)
Non-partisan		-0.582+		0.043		-1.371***
		(0.335)		(0.293)		(0.370)
Welfare committee		0.910***		1.312***		-0.131
		(0.185)		(0.181)		(0.171)
Education committee		0.566***		0.394**		1.768***
		(0.161)		(0.150)		(0.175)
Majority party		-0.234*		-0.219*		-0.309**
		(0.111)		(0.106)		(0.101)
Seniority		-0.031*		-0.015		-0.034*
		(0.014)		(0.015)		(0.014)
Age		-0.020*		-0.019*		-0.011
		(0.008)		(0.008)		(0.008)
District dummies		✓		✓		✓
Year dummies		✓		✓		✓
AIC	3388	3139	3603	3341	3461	3172
BIC	3436	3493	3651	3695	3509	3526
χ^2	327	539	332	579	250	638
Observations	2991	2991	2991	2991	2991	2991

Note: Standard errors are in parentheses. $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Outcome variables indicate whether a legislator has proposed a bill relating to welfare, health, or education issues as a main sponsor. The baseline group for legislator type is men elected to the non-quota tier. The baseline category for each party identification is the party KMT.

Figure 3: Marginal Effects with 95% CIs Based on Regressions in Table 2
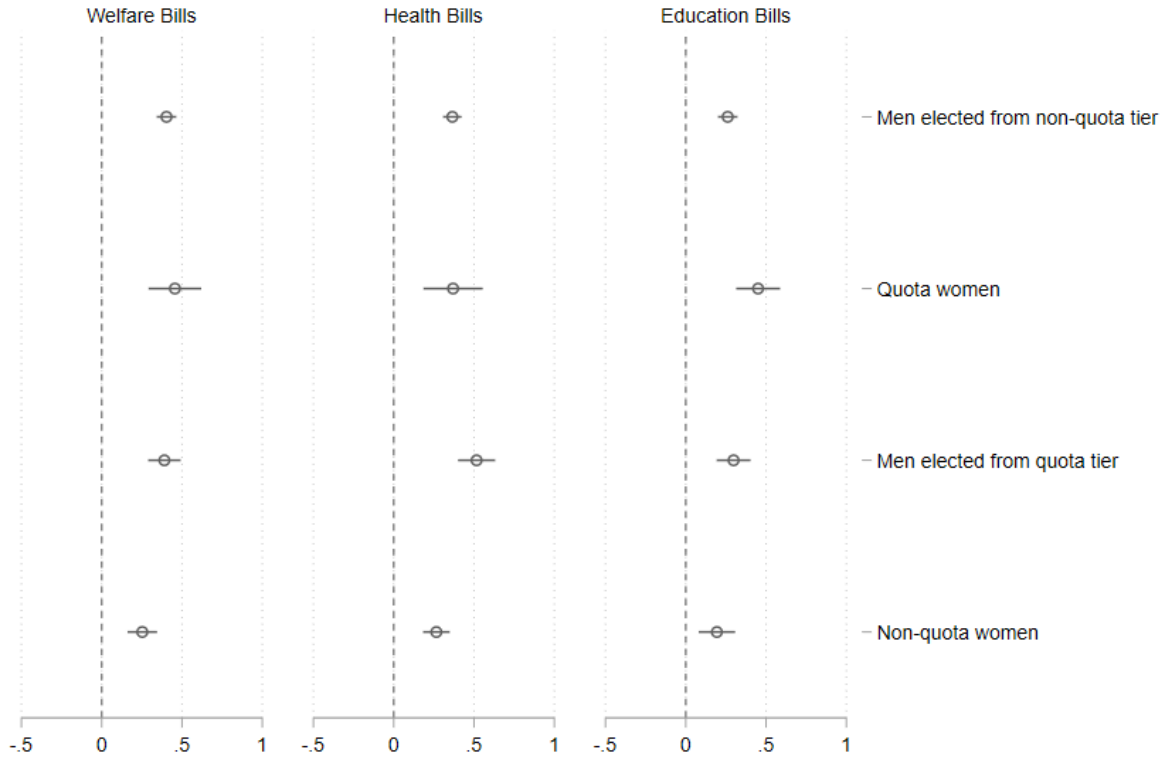
Note: The figure shows the post-quota marginal effects on the outcome variables with 95% confidence intervals, based on the logistic regressions in Table 2. Each plot indicates the average predicted difference for each legislator group before and after the quota implementation.

Turning now to the interpretation of the main interaction effect, Figure 3 shows the marginal effect of a quota on proposing welfare, health, and education issues. A marginal change to the post-quota period has significantly positive effects for all types of legislators: quota women, men elected to the quota tier, non-quota women, and men elected to the non-quota tier. This means that following the quota introduction, all of these legislators are more likely to introduce welfare, health, and education bills by around 40 percentage points. Importantly, however, when comparing between the effects across the legislator types, as Figure 3 shows, we find that a marginal pre-post change has no statistically significant differences across the legislator groups because the confidence intervals of each group largely overlapped for each issue area. In addition to the main findings from the table, the coefficients of the control variables reveal some interesting results. For instance, legislators from the center-left DPP are less likely to introduce welfare, health, and education issues.

We find similar results for legislators who are members of the majority party. To probe the differences in legislative behavior across the gender and electoral tier of the legislators, next, we consider a set of difference-in-differences models. Through this approach, we also aim to further investigate the variation in the outcome variables by using the bill proposal rate instead of a simple dummy variable indicating the bill proposed.

To tap into the quota effect on the differences in the legislative initiation across quota and non-quota tiers, the traditional difference-in-differences strategy is presented. The robustness standard errors are clustered on the individual-legislator level in the models due to the concern that the dataset could include multiple observations for the same legislator, which are certainly not independent of each other.

Table 3: Difference-in-Differences Analysis: Effect of Quotas on Social Policy Initiation (Comparing between Tiers)

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Quota tier	-0.016**	-0.006	-0.013$^+$	-0.017*	-0.012	-0.021$^+$
	(0.005)	(0.008)	(0.007)	(0.008)	(0.011)	(0.011)
Post	0.018***	0.025***	0.002	0.024**	-0.025*	0.037***
	(0.004)	(0.005)	(0.004)	(0.008)	(0.011)	(0.009)
Post × quota tier	0.017*	0.021$^+$	0.011	0.017*	0.021$^+$	0.011
	(0.007)	(0.011)	(0.008)	(0.007)	(0.011)	(0.008)
Individual controls	✓	✓	✓	✓	✓	✓
District dummies				✓	✓	✓
Year dummies				✓	✓	✓
Observations	2991	2991	2991	2991	2991	2991

Note: Robust standard errors are in parentheses and clustered at the individual legislator level. Outcome variables measure the share of introducing welfare, health, and education issues. $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3 presents the related results from a difference-in-differences estimation. Models (1)–(3) show comparisons between quota and non-quota tiers before and after the quota introduction. Models (4)–(6) additionally include the district and year fixed effects. Legislators elected to the quota tier are on average more likely to introduce welfare, health, and education bills than are legislators elected to the non-quota tier, and the effects are signifi-

cantly revealing for the welfare and health bills.[13] The estimates from Model (1) imply an increase in the probability of introducing welfare bills by 1.7 percentage points. To examine the plausibility of our identification strategy, we conduct a placebo difference-in-differences test. Appendix Table S.13 shows the estimates of the falsification test from a similar specification for the 1999–2004 pre-quota period. The placebo test shows no significant quota effect before the quota introduction. The above findings indicate that, comparing quota and non-quota tiers, there is a sizable quota effect on introducing social policy issues. As mentioned, it is less likely to observe such a quota effect due to the increased electoral competition on the non-quota tier and the difference in the electoral rules between quota and non-quota tiers. These results reassure us that these factors would not completely drive any quota-mandate, gender, or quota-hindering effect in the following analyses.

Next, we test our main theoretical implications—the quota-mandate, gender effect, and quota-hindering arguments. We develop a set of extended difference-in-differences models, which further account for the gender difference across the two electoral tiers.[14]

Table 4 pertains to the results for the extended difference-in-differences models. As expected, the coefficients of *quota tier × post × women* are significantly positive for both welfare and education issues, which indicates that quota women introduce significantly more welfare and education issues than any other group of legislators does. Although the significant effect does not persist for health issues, the results are in line with the presence argument. This finding generally supports the hypothesis that quotas increase the probability of quota women introducing welfare and education issues at a higher rate

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[13]Appendix Table S.9 reports the results for baseline models, and Table S.11 shows the results for controlling either year or district fixed effect. None of this changed the estimated interaction effect by much.

[14]The extended models, then, take the following form: $Y_{idt} = \beta_0 + \beta_1 QuotaTier_{it} + \beta_2 Post_{it} + \beta_3 Women_i + \beta_4 QuotaTier_{it} \times Post_{it} + \beta_5 QuotaTier_{it} \times Women_i + \beta_6 Post_{it} \times Women_i + \beta_7 QuotaTier_{it} \times Post_{it} \times Women_i + \eta_{it} + \lambda_t + \theta_d + \varepsilon_{idt}$, where Y_{idt} is the dependent variable measuring the bill share of welfare, health, or education issues for legislator i in electoral district d and year t. It should be noted that we applied a natural logarithmic transformation to the dependent variables to normalize the excessive null proposals. $QuotaTier_{it}$ is a binary variable indicating whether a legislator was elected to the tier where the quota was introduced; $Post_{it}$ and $Women_i$ are binary variables denoting the post-quota period and gender; η_{it} is a vector of legislator characteristic controls; λ_j and θ_k are year and district fixed effects; and ε_{idt} is a random error term.

Table 4: Extended Difference-in-Differences Analysis: Effect of Quotas on Social Policy Initiation (Comparing across Gender and Tiers)

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Post $\times$ quota tier	-0.002	0.026$^+$	-0.000	-0.003	0.023	0.001
	(0.008)	(0.014)	(0.009)	(0.008)	(0.014)	(0.009)
Post $\times$ women	-0.025**	-0.001	-0.005	-0.026**	-0.009	-0.003
	(0.009)	(0.010)	(0.009)	(0.009)	(0.010)	(0.009)
Quota tier $\times$ post $\times$ women	0.044**	-0.015	0.043**	0.051**	-0.008	0.037*
	(0.016)	(0.026)	(0.016)	(0.016)	(0.027)	(0.015)
Individual controls	✓	✓	✓	✓	✓	✓
District dummies				✓	✓	✓
Year dummies				✓	✓	✓
Observations	2991	2991	2991	2991	2991	2991

Note: Robust standard errors are in parentheses and clustered at the individual legislator level. Outcome variables measure the share of introducing welfare, health, and education issues. $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

compared with other group of legislators (Hypothesis 1a).

As elaborated in the appendix (section 2), the coefficient of *post $\times$ women* can be explained as the gender differences in the legislative initiation among legislators elected to the non-quota tier before and after the quota introduction. This setup is intended to test the gender effect argument (Hypothesis 2a). There is no effect of *post $\times$ women* on education and health issues. In other words, when we compare non-quota women with men elected to the non-quota tier, we find no significant quota effect. Notably, the significant negative coefficient of *post $\times$ women* on welfare issues is spurious and should be interpreted cautiously, with *post $\times$ women* being significantly negative in the placebo test (Appendix Table S.14). It is highly likely that we might have picked up the effect from the general trend over the years. The results, therefore, do not provide evidence supporting the gender effect hypothesis on legislative initiation (Hypothesis 2a). Although gender quotas lead to quota women introducing more social policy issues, surprisingly, a related quota effect does not exist for non-quota women. This finding stands in contrast to, for instance, the longstanding "critical mass" argument: As the female presence in the legislature grows, not all women are likely to initiate issues that have long been considered women's interests.

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In a similar vein, again, as mapped out in the appendix (section 2), the coefficient of *post × quota tier* is related to the difference in legislative initiation among male legislators across the quota and non-quota tiers before and after the quota introduction, which reflects the hindering hypothesis. As for the coefficient of *post × quota tier*, the empirical results do not bear out our expectation for the quota-hindering argument that the coefficient would be negatively associated with the social policy initiation, as the estimates are almost precisely zero on welfare and education issues. In contrast to the hindering argument, quota introduction does have a sizable, positive effect on the initiation of health issues for men elected to the quota tier, and the effect is significant at the 90 % level. Comparing men elected to the quota tier with those who were not, the results suggest that quota introduction does not prohibit those men elected to the quota tier, who were electorally most directly affected by quota during the last election, from initiating social policy issues. Contrary to a hindering effect, the results reveal a sizable positive effect of quotas on health issues when comparing the two groups of men.

An alternative explanation not assessed in this paper is the quota effect on the variation of co-sponsorship in these social policy issues. One could argue that legislative co-sponsorship can drive away some of the quota effects, as co-sponsorship activity is not subject to strong party discipline and negative agenda control (Barnes, 2012). Moreover, co-sponsorship is often viewed as an "inexpensive signal" (Wilson & Young, 1997). There is reason to believe that after quota introduction, women legislators could co-sponsor together to work through a bill of women's concerns regardless of the party line. Appendix S.20 presents the results on the quota effect on legislative co-sponsorship on welfare, health, and education issues. The coefficients are insignificant and close to 0. It is thus unlikely that co-sponsorship can explain the main quota effect.

Quota and Legislative Outcome on Social Policy Issues

Having found a positive effect of quotas on legislative initiation of welfare and education issues for quota women, we examine whether the effect also persists in the legislative outcome.

We employ two-stage least squares instrumental variable (2SLS-IV) analyses with legislator groups as instruments. The aim of these instruments is to test the legislative outcome hypothesis while further validating the results for legislative initiation models. Here, one endogeneity concern relates to the issue of reverse causality, which would arise if women who had previously served in the health or education committees were allocated the quota status (Y. P. Kerevel & Atkeson, 2013; Michelle Heath, Schwindt-Bayer, & Taylor-Robinson, 2005). Consequently, their agenda-setting behavior would be primarily driven by their individual characteristics. Another endogeneity issue concerns selection bias. It is difficult to rule out the possibility that certain individual characteristics influence the probability of being a quota legislator, and overlooking these characteristics would lead to biased estimates. To address the endogeneity issues, we drew on a 2SLS-IV approach.[15] In the appendix Table S.19, we address the concern of selection bias by including fixed-effects 2SLS-IV models with entropy balancing. Addressing endogeneity issues increases the confidence that the findings are not thoroughly steered by reverse causality or selection bias.

According to the IV literature (J. D. Angrist, Imbens, & Rubin, 1996; Sovey & Green, 2011), a few conditions must be fulfilled to deliver a valid instrument and unbiased results. First, the instrument must induce a clear change in the probability of treatment. In other words, as highlighted by Bound, Jaeger, and Baker (1995), the instrument has to be strong. To address this issue, we report the Kleibergen-Paap F statistic at the bottom of the IV results. With an F statistic above 10, the null hypothesis of weak instruments can be rejected. Following previous research spelling out rather strong correlations between women's presence and the initiation of social policy issues (Bratton & Haynie, 1999; Schwindt-Bayer, 2006; Volden et al., 2018), in Models (1)–(6), we draw on "quota women" as an instrument to test the quota-mandate hypothesis on the legislative outcome (H1b). Similarly, in the

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[15]Model specification is illustrated as follows: $X_{it} = \alpha_0 + \alpha_1 Z_{it} + \eta_{it} + \varepsilon_{it}$ $\quad Y_{it} = \beta_0 + \beta_1 \widehat{X}_{it} + \mu_{it} + \upsilon_{it}$, where the first equation presents the first stage; X_{it} is a discrete numerical variable indicating the number of bills a legislator has proposed for a specific issue category; Z_{it} is a binary variable denoting the type of legislator; and η_{it} and μ_{it} are vectors of legislator characteristic controls from both stages. The second equation presents the second stage, where $\widehat{X}_{it}$ is the point estimate from the first equation; and Y_{it} indicates the number of proposed bills that have been passed for a specific issue category.

succeeding Models (7)–(12), we aim at testing the gender effect hypothesis on the legislative outcome (H2b), employing "non-quota women" as an instrument.

We now turn to another condition, the independence assumption, which indicates that the instrument needs to be uncorrelated with the error terms (J. D. Angrist et al., 1996). In other words, the instrument should not be related to unmeasured causes of the dependent variable. We thereby include relevant controls in the model specification. The final and most critical condition is that the exclusion restriction criterion must be met. For instance, the instrument should not affect the outcome directly or through other variables, and the backdoor paths must be conditioned (J. Angrist & Imbens, 1994; Morgan & Winship, 2015; Sovey & Green, 2011). Empirically, because the legislator must introduce a bill for it to be enacted, this condition is particularly valid for the situation where the instrument should not directly influence the outcome variable. As for the situation where the instrument should not influence the legislative outcome through other variables, empirically and theoretically, there could be three backdoor channels: serving on the welfare and education committee, as well as being a member of the majority party (Y. P. Kerevel & Atkeson, 2013; Schwindt-Bayer, 2006). Conditioning on these channels should, therefore, block the backdoor paths and increase confidence in the estimation.

Table 5 reports IV estimates on legislative outcomes of welfare, health, and education issues. Hypothesis 1b suggests that after quota introduction, quota women are more likely to enact issues regarding welfare, health, and education. The results from columns (1)–(6) confirm the hypothesis. Columns (1)–(3) show the effects of quota women and the number of proposed bills on the specific issue. Quota women have strong positive and significant effects on introducing more welfare, health, and education bills. Columns (4)–(6) report the IV results for successfully enacting these bills later in the legislative process. Again, the IV coefficients on quota women are highly positive and significant for all three issues. The effect is particularly strong for welfare issues. Being quota women increases the number of enacted welfare bills by 0.71, compared to 0.30 for health bills and 0.58 for education bills. These results indicate sizable effects because the sample legislators, on average, only

successfully enact 0.67 welfare bills, 0.69 health bills, and 0.49 education bills. Similar to the results for quota women, as shown in columns (7)–(12), the "non-quota women" coefficient is positive and highly significant, which confirms the gender effect hypothesis on the legislative outcome (H2b), despite the lack of evidence indicating any gender effect at the legislative initiation stage. Non-quota women also translate into an increase in enacting welfare bills by 0.56 (0.40 for health bills, 0.61 for education bills).

One might worry about reverse causality, which would be the case if women who are interested in social policy issues were listed as quota women. Another concern relates to the issue of underestimation. Because the bill passage data is only available in the legislative record after the year 2001, and considering that bill turnaround time can last up to two years, one would, therefore, worry about the underestimation of the results. To address the issue of reverse causality and underestimation, we draw on entropy balancing for the fixed effects of the 2SLS-IV analysis. The results are reported in the appendix (Table S.19). We restricted the data to a panel dataset with a 6-year window before and after the reform (2005–2010). Reassuringly, the coefficients hardly changed for the test of the legislative outcome. This strongly suggests that reverse causality and underestimation did not drive the results; however, the coefficient for non-quota women is no longer significant at conventional levels. This variation in the results can likely be explained by the fact that a quota instantly generates less mandate for non-quota women to enact on behalf of women compared to the quota-mandate effect on quota women.[16]

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[16]In the same vein, we conducted additional tests on legislative initiative using the panel data just around the quota implementation years. As shown in the appendix (Tables S.16 and S.17), we find no significant short-term quota effect on the legislative initiative. This result suggests that the gender quota effect will emerge a few years after implementation.

Table 5: 2SLS-IV Estimation on Legislative Outcome

	First stage			Second stage			First stage			Second stage		
	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education	(7) Welfare	(8) Health	(9) Education	(10) Welfare	(11) Health	(12) Education
N. of welfare bills				0.714*** (0.052)						0.556*** (0.054)		
N. of health bills					0.301*** (0.068)						0.397*** (0.044)	
N. of education bills						0.576*** (0.079)						0.605*** (0.062)
Quota women	1.574*** (0.404)	2.069*** (0.620)	0.973*** (0.234)									
Non-quota women							1.120** (0.292)	2.442*** (0.671)	1.158*** (0.319)			
Welfare committee	0.949** (0.315)	2.715*** (0.732)	-0.006 (0.179)	-0.132 (0.089)	0.208 (0.206)	-0.037 (0.044)	1.109*** (0.334)	2.879*** (0.673)	0.071 (0.175)	0.052 (0.077)	-0.082 (0.137)	-0.041 (0.050)
Education committee	0.959** (0.314)	0.961+ (0.562)	2.704*** (0.388)	-0.114 (0.092)	-0.095 (0.109)	-0.371 (0.239)	1.005*** (0.297)	0.931+ (0.539)	2.688*** (0.379)	0.062 (0.085)	-0.207+ (0.117)	-0.454* (0.181)
Majority party	0.111 (0.137)	0.634* (0.260)	0.118 (0.110)	-0.013 (0.032)	-0.058 (0.063)	0.033 (0.028)	0.050 (0.141)	0.508* (0.251)	0.058 (0.112)	0.003 (0.034)	-0.118* (0.053)	0.030 (0.032)
Education	0.040 (0.177)	0.769* (0.367)	0.068 (0.153)	0.067 (0.043)	-0.021 (0.074)	-0.026 (0.036)	0.098 (0.181)	0.916* (0.376)	0.138 (0.160)	0.069+ (0.039)	-0.092 (0.079)	-0.027 (0.038)
KMT	0.672*** (0.169)	1.149*** (0.303)	0.196 (0.129)	-0.143* (0.058)	-0.030 (0.088)	-0.086** (0.032)	0.654*** (0.173)	1.096*** (0.297)	0.171 (0.133)	-0.035 (0.047)	-0.143* (0.065)	-0.092* (0.038)
Age	-0.029** (0.010)	-0.028+ (0.016)	-0.019* (0.009)	0.002 (0.003)	-0.007* (0.003)	0.001 (0.002)	-0.020* (0.009)	-0.010 (0.016)	-0.010 (0.008)	-0.002 (0.002)	-0.004 (0.003)	0.002 (0.002)
Seniority	0.004 (0.016)	0.003 (0.031)	-0.002 (0.012)	-0.007 (0.005)	-0.002 (0.006)	0.002 (0.003)	-0.009 (0.015)	-0.026 (0.034)	-0.016 (0.012)	-0.006 (0.004)	-0.002 (0.006)	0.002 (0.003)
N	2375	2375	2375	2375	2375	2375	2375	2375	2375	2375	2375	2375
Kleibergen-Paap F stat				15.170	11.122	17.330				14.754	13.252	13.170
Kleibergen-Paap LM Test p-value				0.001	0.003	0.000				0.001	0.002	0.001

Robust standard errors are in parentheses.
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Conclusion

The existing research examining the association between women's descriptive and substantive representation argues that with increasing numbers of women elected to parliament, female legislators place a higher priority than do male legislators on social policy issues (Bratton & Ray, 2002; Schwindt-Bayer, 2006). Using different estimation strategies on a unique dataset of bill initiation and passage from Taiwan, a new democracy with a mixed electoral system, this paper shows that this is merely one side of the story. The influence of gender quotas on women-friendly social policymaking is no panacea; it is dependent on the interplay between formal representation (electoral tier) and gender. A theoretical model is proposed connecting the rationale behind quota-mandate, gender effect, and quota-hindering arguments by systematically comparing the quota effect on legislative behavior between legislators of different electoral tiers and gender.

According to the argument and evidence presented in this paper, the quota-mandate effect exists already in the legislative initiation stage, effectively making it possible for quota women to translate their policy preferences into agenda-setting. The overall finding confirms the quota-mandate argument; that is, quotas can generate a mandate effect for quota women to initiate education and welfare bills at a higher rate compared with any other legislators. While it is argued that women legislators often have common policy pursuits (Franceschet & Piscopo, 2008; Rosenthal, 1998), by comparing the bill initiation behavior on social policy issues between men and women elected to the non-quota tier, our results demonstrate that quotas do not generate related gender effect with non-quota women during the legislative initiation process. The findings, therefore, provide little empirical support for the assumption that women often represent women on typically feminine issues. The sheer number of women is probably not a key determinant for women's legislative initiation behavior. In the case of quota implementation, as the proportion of women in legislature increases, not all women pursue policy agendas addressing typical women's concerns, and formal representation needs to be considered.

At the bill passage stage, however, in line with the theory, the findings resonate with the

quota-mandate and gender effect arguments for quota and non-quota women alike. While the quota effect on enacting welfare, health, and education issues appears a few years after implementation for the non-quota women, the empirical evidence shows that both quota and non-quota women have strong and positive influence on getting these social policy bills passed into law. This finding stands in contrast to the earlier studies arguing that despite women tending to introduce women-oriented bills, they do not typically succeed in enacting the bills of their interests into law (Franceschet & Piscopo, 2008). Overall, this suggests that quotas have expanded opportunities for all women legislators to advance their social policy agenda in the legislative enactment process. However, quotas have done little for non-quota women to initiate their social policy goals from the very outset.

Moreover, the paper provides no evidence in favor of the quota-hindering argument in the legislation process. The early literature theorizes that as the number of women increases, the elected men who feel particularly threatened are likely to generate adversarial devaluation on the issues about which women care (Swers, 2002; Thomas, 1991). Quite to the contrary, the findings reveal that quotas have a sizable positive effect on initiating health issues when comparing men elected to the quota tier with those who were not. This paper provides a new perspective to account for formal representation, the way women are elected, in the theoretically longstanding descriptive-substantive representation link by distinguishing between quota and non-quota women using the case of quota implementation in a mixed electoral system.

One might argue that the case is unique. However, Taiwan's mixed-member electoral system, with legislative reserved-seats quotas implemented on one electoral tier, echoes many other cases. For instance, similar quota implementation in a mixed system also took place in the Mexican Chamber of Deputies and the South Korean National Assembly. Examination of a new consolidated democracy coupled with increasing gender equality and the development of the welfare state makes this research relevant beyond Taiwan. The empirical implications of this paper raise new and general lessons about how the interplay between gender and quota matters to the extent of the quota effect. The findings speak to

larger questions regarding the implications of implementing legislated reserved seat quotas on the pursuit of a social policy agenda. This study goes beyond the existing literature by further discerning between quota tiers, which allows for the observation of how legislators of the same gender can have very different preferences concerning initiating social policy issues.

While the study provides new insights into the debate on gender quotas and women's descriptive-substantive representation, issues remain for future research. Importantly, quota law has been criticized for breeding political patronage by promoting candidates with high levels of party loyalty (Matland, 2006). Admittedly, in the case of quota introduction in a closed-list PR system, the party loyalty of legislators may indeed play a role in candidate selection (Herron, 2002). Future studies may generate evidence to capture how loyalty can affect the policy responsiveness of quota women and further probe the multifaceted implications of quota law.

References

Angrist, J., & Imbens, G. (1994). Identification and estimation of local average treatment effects. *Econometrica*, *62*(2), 467–475.

Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of causal effects using instrumental variables. *Journal of the American Statistical Association*, *91*(434), 444–455.

Aspalter, C. (2002). Democratization and welfare state development in Taiwan. In (pp. 117–135). London: Routledge.

Avelino, G., Brown, D. S., & Hunter, W. (2005). The effects of capital mobility, trade openness, and democracy on social spending in Latin America, 1980–1999. *American Journal of Political Science*, *49*(3), 625–641.

Barnes, T. D. (2012). Gender and legislative preferences: Evidence from the Argentine provinces. *Politics & Gender*, *8*(4), 483–507.

Batto, F. N., & Huang, H.-t. (2016). Chapter four: Executive competition, electoral rules, and faction systems in taiwan. In N. F. Batto, C. Huang, T. C. Tan, & G. W. Cox (Eds.), *Mixed-member electoral systems in constitutional context.* Ann Arbor: University of Michigan Press.

Batto, N. F. (2012). Differing mandates and party loyalty in mixed-member systems: Taiwan as a baseline case. *Electoral Studies*, *31*(2), 384–392.

Baumgartner, F. R., & Jones, B. D. (2002). *Policy dynamics.* Chicago: University of Chicago Press.

Beckwith, K., & Cowell-Meyers, K. (2007). Sheer numbers: Critical representation thresholds and women's political representation. *Perspectives on Politics*, *5*(3), 553–565.

Bormann, N.-C., & Golder, M. (2013). Democratic electoral systems around the world, 1946–2011. *Electoral Studies*, *32*(2), 360–369.

Bound, J., Jaeger, D. A., & Baker, R. M. (1995). Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American Statistical Association*, *90*(430), 443–450.

Bratton, K. A. (2005). Critical mass theory revisited: The behavior and success of token women in state legislatures. *Politics & Gender*, *1*(1), 97–125.

Bratton, K. A., & Haynie, K. L. (1999). Agenda setting and legislative success in state legislatures: The effects of gender and race. *The Journal of Politics*, *61*(3), 658–679.

Bratton, K. A., & Ray, L. P. (2002). Descriptive representation, policy outcomes, and municipal day-care coverage in Norway. *American Journal of Political Science*, *46*(2), 428–437.

Bucci, P. P., Cubo, C., Cosenza, R., Paola, M. D., Calabria, U., Benedetto, M. A. D., & Scoppa, V. (2012). The impact of gender quotas on electoral participation: Evidence from Italian municipalities. *European Journal of Political Economy*, *35*, 0–18.

Carey, J. M., & Shugart, M. S. (1995). Incentives to cultivate a personal vote: A rank ordering of electoral formulas. *Electoral Studies*, *14*(4), 417–439.

Catalano Weeks, A. (2018). Quotas and party priorities: Direct and indirect effects of quota laws. *Political Research Quarterly*. (Online First)

Chattopadhyay, R., & Duflo, E. (2004). Women as policy makers: Evidence from a randomized policy experiment in india. *Econometrica*, *72*(5), 1409–1443.

Childs, S. (2004). *New labour's woman MPs.* New York: Routledge.

Childs, S., & Krook, M. L. (2012). Labels and Mandates in the United Kingdom. In S. Franceschet, M. L. Krook, & J. M. Piscopo (Eds.), *The impact of gender quotas* (pp. 89–102). New York: Oxford University Press.

Clayton, A., Josefsson, C., Mattes, R., & Mozaffar, S. (2019). In whose interest? Gender and mass–elite priority congruence in Sub-Saharan Africa. *Comparative Political Studies*, *52*(1), 69–101.

Clayton, A., Josefsson, C., & Wang, V. (2014). Present without presence? Gender, quotas and debate recognition in the Ugandan parliament. *Representation*, *50*(3), 379–392.

Clayton, A., & Zetterberg, P. (2018). Quota shocks: Electoral gender quotas and government spending priorities worldwide. *The Journal of Politics*, *80*(3), 916–932.

Clots-Figueras, I. (2012). Are female leaders good for education? Evidence from India.

American Economic Journal: Applied Economics, *4*(1), 212–44.

Dahlerup, D. (1988). From a small to a large minority: Women in Scandinavian politics. *Scandinavian Political Studies*, *11*(4), 275–298.

Fell, D. (2012). *Government and politics in Taiwan*. London: Routledge.

Fleckenstein, T., & Lee, S. C. (2017). The politics of labor market reform in coordinated welfare capitalism. *World Politics*, *69*(1), 144–183.

Folke, O., & Rickne, J. (2016). The glass ceiling in politics: Formalization and empirical tests. *Comparative Political Studies*, *49*(5), 567–599.

Franceschet, S., & Piscopo, J. M. (2008). Gender quotas and women's substantive representation: Lessons from Argentina. *Politics & Gender*, *4*(3), 393–425.

Goetz, A.-M., & Hassim, S. (2003). *No shortcuts to power: African women in politics and policy making* (Vol. 3). London: Zed Books.

Hecock, R. D. (2006). Electoral competition, globalization, and subnational education spending in Mexico, 1999–2004. *American Journal of Political Science*, *50*(4), 950–961.

Herron, E. S. (2002). Electoral influences on legislative behavior in mixed-member systems: Evidence from Ukraine's Verkhovna Rada. *Legislative Studies Quarterly*, *27*(3), 361–382.

IDEA. (2019). *Gender quotas database of International Institute for Democracy and Electoral Assistance*. `https://www.idea.int/data-tools/data/gender-quotas/database`. ((accessed September 16, 2019))

Kanter, R. M. (1977). *Men and women of the corporation*. New York: Basic Books.

Kanthak, K., & Krause, G. A. (2012). *The diversity paradox: Political parties, legislatures, and the organizational foundations of representation in America*. New York : Oxford University Press.

Kerevel, Y. (2019). Empowering women? Gender quotas and women's political careers. *The Journal of Politics*, *81*(4), 1167–1180.

Kerevel, Y. P., & Atkeson, L. R. (2013). Explaining the marginalization of women in

legislative institutions. *The Journal of Politics*, *75*(4), 980–992.

Krook, M. L., & Schwindt-Bayer, L. (2012). Electoral institutions. In G. Waylen, K. Celis, J. Kantola, & L. S. Weldon (Eds.), *The Oxford handbook of gender and politics.* New York: Oxford University Press.

Lyn, K., Clarke, E., Susan, & Fox, A., Barbara. (1991). Ways women politicians are making a difference. In D. L. Dodson (Ed.), *Gender and policymaking: Studies of women in office.* New Brunswick: Center for the American Woman and Politics, Eagleton Institute of Politics.

Mares, I., & Carnes, M. E. (2009). Social policy in developing countries. *Annual Review of Political Science*, *12*, 93–113.

Massicotte, L., & Blais, A. (1999). Mixed electoral systems: A conceptual and empirical survey. *Electoral Studies*, *18*(3), 341–366.

Matland, R. (2006). Electoral quotas: Frequency and effectiveness. In D. Dahlerup (Ed.), *Women, quotas and politics.* New Brunswick: Center for the American Woman and Politics, Eagleton Institute of Politics.

Michelle Heath, R., Schwindt-Bayer, L. A., & Taylor-Robinson, M. M. (2005). Women on the sidelines: Women's representation on committees in Latin American legislatures. *American Journal of Political Science*, *49*(2), 420–436.

Morgan, S. L., & Winship, C. (2015). *Counterfactuals and causal inference.* New York: Cambridge University Press.

Norris, P., et al. (2004). *Electoral engineering: Voting rules and political behavior.* New York: Cambridge University Press.

O'Brien, D. Z., & Rickne, J. (2016). Gender quotas and women's political leadership. *American Political Science Review*, *110*(1), 112–126.

Pande, R., Topalova, P., Chattopadhyay, R., Duflo, E., & Beaman, L. (2009). Powerful women: Does exposure reduce bias? *Quarterly Journal of Economics*, *124*(4), 1497–1540.

Perrigo, S. (1996). Women and change in the Labour Party, 1979-1995. *Parliamentary*

Affairs, *49*(1), 116–130.

Phillips, A. (1995). *The politics of presence.* New York: Oxford University Press.

Pitkin, H. F. (1967). *The concept of representation.* Berkeley: University of California Press.

Reingold, B. (2000). *Representing women: Sex, gender, and legislative behavior in Arizona and California.* Chapel Hill: University of North Carolina Press.

Rickne, J., Besley, T., Folke, O., & Persson, T. (2017). Gender quotas and the crisis of the mediocre man: Theory and evidence from Sweden. *American Economic Review*, *107*(985), 2204–2242.

Rosenthal, C. S. (1998). *When women lead: Integrative leadership in state legislatures.* New York : Oxford University Press.

Schwindt-Bayer, L. A. (2006). Still supermadres? gender and the policy priorities of latin american legislators. *American Journal of Political Science*, *50*(3), 570–585.

Schwindt-Bayer, L. A., & Mishler, W. (2005). An integrated model of women's representation. *The Journal of Politics*, *67*(2), 407–428.

Sovey, A. J., & Green, D. P. (2011). Instrumental variables estimation in political science: A readers' guide. *American Journal of Political Science*, *55*(1), 188–200.

Swers, M. L. (1998). Are women more likely to vote for women's issue bills than their male colleagues? *Legislative Studies Quarterly*, 435–448.

Swers, M. L. (2002). *The difference women make: The policy impact of women in congress.* Chicago: University of Chicago Press.

Thomas, S. (1991). The impact of women on state legislative policies. *The Journal of Politics*, *53*(4), 958–976.

Volden, C., Wiseman, A. E., & Wittmer, D. E. (2013). When are women more effective lawmakers than men? *American Journal of Political Science*, *57*(2), 326–341.

Volden, C., Wiseman, A. E., & Wittmer, D. E. (2018). Women's issues and their fates in the US congress. *Political Science Research and Methods*, *6*(4), 679–696.

Weeks, A. C., & Baldez, L. (2014). Quotas and qualifications: The impact of gender quota

laws on the qualifications of legislators in the Italian parliament. *European Political Science Review*, *7*(1), 119–144.

Wilson, R. K., & Young, C. D. (1997). Cosponsorship in the US congress. *Legislative Studies Quarterly*, 25–43.

Wong, J. (2003). *Healthy democracies: Welfare policies in Taiwan and South Korea.* New York: Cornell Univeristy Press.

The Effects of Gender Quotas on Substantive Representation: Evidence from Taiwan

Supplementary Appendix

1 Taiwan's Gender Quotas Introduction

Figure S.1: Proportion of Women Legislators in Taiwan's Legislature 1995-2018
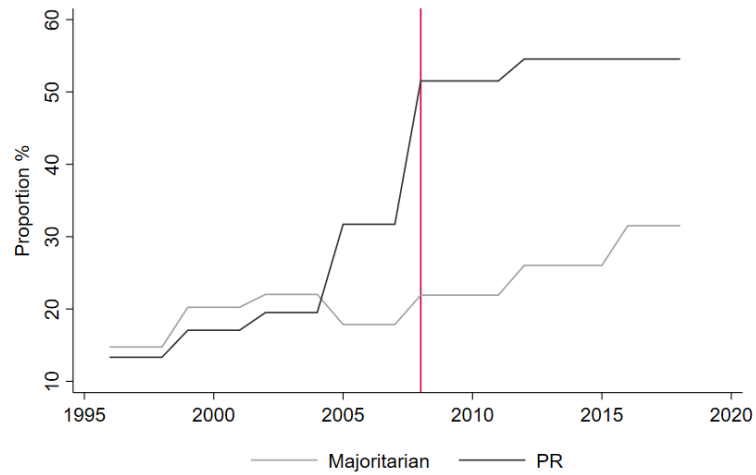
Note: The data indicate the proportion of elected women legislators at the beginning of each term, which were compiled from the governmental open data on election: https://www.cec.gov.tw/english/cms/le

2 Extended Difference-in-differences Illustration

$$Y_{idt} = \beta_0 + \beta_1 Quota\ Tier_{it} + \beta_2 Post_{it} + \beta_3 Female_i$$

$$+ \beta_4 Quota\ Tier_{it} \times Post_{it} + \beta_5 Quota\ Tier_{it} \times Female_i$$

$$+ \beta_6 Post_{it} \times Female_i + \beta_7 Quota\ Tier_{it} \times Post_{it} \times Female_i + \eta_{it} + \lambda_t + \theta_d + \varepsilon_{idt} \tag{1}$$

Consider $\hat{\beta}_7$ is

$$\hat{\beta}_7 = \left[\left(\bar{Y}_{F,Quota\ Tier,1} - \bar{Y}_{F,Quota\ Tier,0} \right) - \left(\bar{Y}_{M,Quota\ Tier,1} - \bar{Y}_{M,Quota\ Tier,0} \right) \right]$$

$$- \left[\left(\bar{Y}_{F,Non-quota\ Tier,1} - \bar{Y}_{F,Non-quota\ Tier,0} \right) - \left(\bar{Y}_{M,Non-quota\ Tier,1} - \bar{Y}_{M,Non-quota\ Tier,0} \right) \right] \tag{2}$$

where the F subscript refers to the female and the M subscript refers to the male. The quota tier subscript means the legislators elected to the quota tier, and the non-quota tier subscript means those elected to the non-quota tier. The subscript 1 and 0 denotes the time change ($Post$). $\hat{\beta}_7$ is the extended difference-in-differences estimate, which denotes the average treatment effect.

Next, consider $\hat{\beta}_4$ is

$$\hat{\beta}_4 = \left[\left(\bar{Y}_{M,Quota\ Tier,1} - \bar{Y}_{M,Quota\ Tier,0} \right) \right] - \left[\left(\bar{Y}_{M,Non-quota\ Tier,1} - \bar{Y}_{M,Non-quota\ Tier,0} \right) \right] \tag{3}$$

where the $\hat{\beta}_4$ shows the tier difference on the legislative initiative behavior among the male legislators before and after introducing the quotas, which resonates with the hindering hypothesis on legislative initiative (H3).

Similarly, consider $\hat{\beta}_6$ is

$$\hat{\beta}_6 = \left[\left(\bar{Y}_{F,Non-quotaTier,1} - \bar{Y}_{F,Non-quotaTier,0} \right) \right] - \left[\left(\bar{Y}_{M,Non-quotaTier,1} - \bar{Y}_{M,Non-quotaTier,0} \right) \right] \tag{4}$$

where the $\hat{\beta}_6$ shows the gender difference on the legislative initiative behavior among the legislators elected to the non-quota tier under majoritarian rule before and after the quota introduction, which echoes the spillover presence hypothesis on legislative initiative (H2a).

3 Data Construction

3.1 Variables Definition

Table S.1

Variable	Variable Definition
Dependent Variables:	
Propose_wel_main	binary variable indicating whether legislator has proposed welfare bill (as main sponsor)
Propose_hea_main	binary variable indicating whether legislator has proposed health bill (as main sponsor)
Propose_edu_main	binary variable indicating whether legislator has proposed education bill (as main sponsor)
Wel_main	number of welfare bills legislator has proposed
Hea_main	number of health bills legislator has proposed
Edu_main	number of education bills legislator has proposed
Log_rate_wel_main	logged proportion of proposed welfare bill
Log_rate_hea_main	logged proportion of proposed health bill
Log_rate_edu_main	logged proportion of proposed education bill
Wel_passage_main	number of proposed welfare bills that have been passed
Hea_passage_main	number of proposed health bills that have been passed
Edu_passage_main	number of proposed education bills that have been passed
Independent Variables:	
Female	binary variable indicating whether legislator is female
Quota tier	binary variable indicating whether legislator is elected to the quota tier
Post	binary variable indicating whether legislator is in post-quotas period
Quota women	binary variable indicating whether legislator is female and elected to the quota tier
Non − quota women	binary variable indicating whether legislator is female and elected to the non-quota tier
Men elected from quota tier	binary variable indicating whether legislator is male and elected to the quota tier
Type	categorical variable indicating legislator types. Reference category refers to male legislators elected to the non-quota tier; 1 indicates female legislators elected to the quota tier, 2 indicates male legislators elected to the quota tier, 3 indicates female legislators elected to the non-quota tier
Control Variables:	
Pid	categorical variable indicating party identification. Reference category refers to KMT Party; 1 indicates DPP Party; 2 refers to PFP Party; 3 denotes other parties. Independent and non-partisan solidarity union are coded as non-partisan (cat. 4)
Education	binary variable indicating whether legislator has been in legislature education committee
Welfare	binary variable indicating whether legislator has been in legislature welfare committee
Education	binary variable indicating whether legislator has PhD degree
Seniority	indicating number of years a legislator has served in legislature
Majority	binary variable indicating whether legislator is member of majority party
Age	age of respondent in years

Source: Legislative records. I also draw on anecdotes from the online newspaper *Liberty Times* and *Taipei Times* to capture the switch in party identification and the year of exit.

3.2 Coding Scheme for the Dependent Variables

Table S.2: Subcategories of Health, Education and Welfare Issues

Health	Education	Welfare
300: General	600: General Education	1300: General
301: Health Care Reform	601: Higher Education	1302: Low-Income Assistance
302: Insurance	602: Elementary & Secondary Education	1303: Elderly Assistance
321: Drug Industry	603: Underprivileged Education	1304: Disabled Assistance
322: Medical Facilities	604: Vocational Education	1305: Volunteer Associations
323: Insurance Providers	606: Special Education	1308: Child Care
324: Medical Liability	607: Education Excellence	1399: Other (Assistance for Racial and Gender Equality)[a]
325: Manpower	698: R&D	
331: Disease Prevention	699: Other	
332: Infants and Children		
333: Mental		
334: Long-term Care		
335: Drug Coverage and Cost		
341: Tobacco Abuse		
342: Drug and Alcohol Abuse		
398: R&D		
399: Other		

Source: Coding scheme is based on Baumgartner and Jones (2002)'s Comparative Political Agenda codebook that covers major policy issues and their subcategories.
[a] Additionally, for the major category health, I included a subcategory — Social Welfare Assistance for Racial and Gender Equality to capture the social welfare programs designed for women and the minority. This seeks to incorporate the relevant social welfare programs designed for women into the dependent variable.

Table S.3: Time Period for Each Observation

term	sessions	period	year
4th	1, 2	1999/02/06 - 2000/01/16	1999
4th	3, 4	2000/02/18 - 2001/01/04	2000
4th	5, 6	2001/02/20 - 2002/01/18	2001
5th	1, 2	2002/02/19 - 2003/01/14	2002
5th	3, 4	2003/02/25 - 2004/01/13	2003
5th	5, 6	2004/02/06 - 2005/01/24	2004
6th	1, 2	2005/02/25 - 2006/01/13	2005
6th	3, 4	2006/02/21 - 2007/01/19	2006
6th	5, 6	2007/02/27 - 2007/12/21	2007
7th	1, 2	2008/02/22 - 2009/01/13	2008
7th	3, 4	2009/02/20 - 2010/01/12	2009
7th	5, 6	2010/02/23 - 2011/01/12	2010
7th	7, 8	2011/02/22 - 2011/12/14	2011
8th	1, 2	2012/02/24 - 2013/01/15	2012
8th	3, 4	2013/02/26 - 2014/01/14	2013
8th	5, 6	2014/02/21 - 2015/01/23	2014
8th	7, 8	2015/02/24 - 2015/12/18	2015
9th	1, 2	2016/02/19 - 2016/12/30	2016
9th	3, 4	2017/02/17 - 2017/12/29	2017
9th	5, 6	2018/02/27 - 2018/12/28	2018

Note: To avoid invoking possible serial correlation—bill proposing behavior in the beginning of the year as an explanation of the preceding year, and to be consistent with each session, I code bill proposing in the first two weeks of the year as in the previous year. The data is aggregated on the yearly level to account for more variation. The data excludes the last two sessions of the 9th legislature. This is because those sessions are still going on during the data collection process.

4 Descriptive Statistics

Table S.4: Summary Statistics (2005-2010)

	μ	σ	Min	Max	N
Dependent Variables:					
$Propose\_wel\_main$	0.46	0.50	0	1	420
$Propose\_hea\_main$	0.49	0.50	0	1	420
$Propose\_edu\_main$	0.38	0.49	0	1	420
Wel_main	1.32	2.11	0	12	420
Hea_main	1.23	1.96	0	14	420
Edu_main	0.83	1.56	0	11	420
$Log\_share\_wel\_main$	0.06	0.09	0	0.59	420
$Log\_share\_hea\_main$	0.06	0.08	0	0.59	420
$Log\_share\_edu\_main$	0.04	0.06	0	0.41	420
$Wel\_passage\_main$	0.63	1.27	0	8	420
$Hea\_passage\_main$	0.31	0.68	0	4	420
$Edu\_passage\_main$	0.42	0.96	0	7	420
Independent and Control Variables:					
$Female$	0.27	0.45	0	1	420
$Quota\ tier$	0.21	0.41	0	1	420
$Post$	0.50	0.50	0	1	420
$Quota\ women$	0.06	0.25	0	1	420
$Non-quota\ women$	0.07	0.26	0	1	420
$Men\ elected\ from\ quota\ tier$	0.08	0.27	0	1	420
$Education$	0.11	0.31	0	1	420
$Welfare$	0.12	0.33	0	1	420
$Education$	0.26	0.44	0	1	420
$Seniority$	7.83	4.24	1	18	420
$Majority$	0.49	0.50	0	1	420
Age	52.21	8.35	29	75	420

Table S.5: Summary Statistics (1999-2018)

	μ	σ	Min	Max	N
Dependent Variables:					
$Propose\_wel\_main$	0.39	0.49	0	1	2991
$Propose\_hea\_main$	0.47	0.50	0	1	2991
$Propose\_edu\_main$	0.35	0.48	0	1	2991
Wel_main	1.06	2.16	0	24	2991
Hea_main	1.72	4.35	0	57	2991
Edu_main	0.95	2.16	0	30	2991
$Log\_share\_wel\_main$	0.05	0.09	0	0.69	2991
$Log\_share\_hea\_main$	0.07	0.11	0	0.69	2991
$Log\_share\_edu\_main$	0.04	0.09	0	0.69	2991
$Wel\_passage\_main$	0.67	1.58	0	19	2375
$Hea\_passage\_main$	0.69	1.91	0	20	2375
$Edu\_passage\_main$	0.49	1.21	0	11	2375
Independent and Control Variables :					
$Female$	0.26	0.44	0	1	2991
$Quota\ tier$	0.24	0.43	0	1	2991
$Post$	0.38	0.49	0	1	2991
$Quota\ women$	0.06	0.24	0	1	2991
$Non-quota\ women$	0.07	0.25	0	1	2991
$Men\ elected\ from\ quota\ tier$	0.05	0.22	0	1	2991
$Education$	0.12	0.32	0	1	2991
$Welfare$	0.12	0.33	0	1	2991
$Education$	0.24	0.43	0	1	2991
$Seniority$	5.88	4.34	1	26	2991
$Majority$	0.51	0.50	0	1	2991
Age	51.39	8.70	26	80	2991

5 Entropy Balancing Results for the Pre-treatment Variables

Entropy balancing is a data preprocessing method developed by Hainmueller (2012) and Hainmueller and Xu (2013), which is used to achieve covariate balance in observational studies with dummy treatment variables. One issue for conventional matching or propensity score methods is that the search for a suitable weighting often fails to balance out all the covariates and even counteracts bias reduction (Hainmueller & Xu, 2013). Entropy balancing addresses these drawbacks and uses a preprocessing step that directly builds into the weight.

Balance checking is no longer necessary compared to the conventional methods.

Table S.6: Entropy Balancing for the Pre-treatment Variables (Female PR Legislators as Treatment)

	Treatment		Control		Control (wt)	
	μ	σ	μ	σ	μ	σ
Education Committee	0.17	0.38	0.11	0.31	0.17	0.37
Welfare Committee	0.50	0.51	0.11	0.32	0.50	0.50
KMT	0.50	0.51	0.58	0.50	0.50	0.50
Majority	0.50	0.51	0.22	0.41	0.50	0.50

Note: Table presents results of entropy balancing for Female PR legislators (treatment) and those who are not (control). The entropy balancing results for other legislator types are presented in the appendix.

Table S.7: Entropy Balancing for the Pre-treatment Variables (Female Majoritarian Legislators as Treatment)

	Treatment		Control		Control (wt)	
	μ	σ	μ	σ	μ	σ
Education Committee	0.36	0.49	0.06	0.24	0.36	0.48
Welfare Committee	0.21	0.41	0.13	0.34	0.17	0.38
KMT	0.69	0.47	0.54	0.50	0.69	0.46
Majority	0.23	0.43	0.25	0.43	0.23	0.42

Note: Table presents results of entropy balancing for female majoritarian legislators (Treatment) and those who are not (Control).

Table S.8: Entropy Balancing for the Pre-treatment Variables (Male PR Legislators as Treatment)

	Treatment		Control		Control (wt)	
	μ	σ	μ	σ	μ	σ
Education Committee	0.25	0.45	0.11	0.31	0.25	0.43
Welfare Committee	0	0	0.16	0.36	0	0.02
KMT	0.75	0.45	0.56	0.50	0.75	0.43
Majority	0.25	0.45	0.24	0.43	0.25	0.43

Note: Table presents results of entropy balancing for Male PR legislators (Treatment) and those who are not (Control).

6 Robustness Checks:

(Extended) Difference-in-differences Models

6.1 Baseline Models

Table S.9: Difference-in-Differences Analysis: Baseline Models

	(1) Welfare	(2) Health	(3) Education
Quota tier	-0.016**	-0.004	-0.014+
	(0.005)	(0.010)	(0.007)
Post	0.018***	0.023***	-0.001
	(0.004)	(0.005)	(0.005)
Post × quota tier	0.018*	0.024+	0.009
	(0.008)	(0.014)	(0.009)
Observations	2991	2991	2991

Standard errors in parentheses

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

Table S.10: Extended Difference-in-Differences Analysis: Baseline Models

	(1) Welfare	(2) Health	(3) Education
Post × quota tier	-0.002	0.027+	-0.006
	(0.008)	(0.016)	(0.011)
Post × women	-0.024**	0.003	-0.012
	(0.009)	(0.012)	(0.012)
Quota tier × post × women	0.043*	-0.023	0.056**
	(0.019)	(0.033)	(0.019)
Observations	2991	2991	2991

Standard errors in parentheses

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

6.2 Controlling for Year/ District Fixed-Effects

Table S.11: Difference-in-Differences Analysis: Controlling for Year/ District Fixed-Effects

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Quota tier	-0.016**	-0.005	-0.013$^+$	-0.018*	-0.013	-0.020$^+$
	(0.005)	(0.008)	(0.007)	(0.009)	(0.012)	(0.011)
Post	0.025**	-0.027*	0.036***	0.017***	0.027***	0.002
	(0.008)	(0.011)	(0.009)	(0.004)	(0.005)	(0.004)
Post × quota tier	0.016*	0.021$^+$	0.011	0.018*	0.021$^+$	0.011
	(0.007)	(0.011)	(0.008)	(0.007)	(0.011)	(0.008)
Individual controls	✓	✓	✓	✓	✓	✓
District dummies				✓	✓	✓
Year dummies	✓	✓	✓			
Observations	2991	2991	2991	2991	2991	2991

Standard errors in parentheses

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

Table S.12: Extended Difference-in-Differences Analysis: Controlling for Year/ District Fixed-Effects

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Post × quota tier	-0.004	0.027[+]	0.000	-0.002	0.022	0.001
	(0.008)	(0.014)	(0.009)	(0.008)	(0.014)	(0.009)
Post × women	-0.025**	0.001	-0.005	-0.026**	-0.011	-0.003
	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)	(0.009)
Quota tier × post × women	0.051**	-0.018	0.040**	0.044**	-0.006	0.040*
	(0.016)	(0.027)	(0.015)	(0.017)	(0.027)	(0.016)
Individual controls	✓	✓	✓	✓	✓	✓
District dummies				✓	✓	✓
Year dummies	✓	✓	✓			
Observations	2991	2991	2991	2991	2991	2991

Standard errors in parentheses

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

6.3 Placebo Test

Table S.13: Difference-in-Differences Analysis: Placebo Test

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Quota tier	-0.014*	-0.005	-0.004	-0.009	-0.010	-0.030
	(0.006)	(0.014)	(0.012)	(0.009)	(0.020)	(0.019)
Post	-0.003	0.005	-0.004	-0.017*	-0.045***	0.003
	(0.005)	(0.007)	(0.007)	(0.008)	(0.013)	(0.010)
Post × quota tier	0.010	0.014	-0.010	0.011	0.019	-0.005
	(0.009)	(0.022)	(0.020)	(0.008)	(0.021)	(0.019)
Individual controls				✓	✓	✓
District dummies				✓	✓	✓
Year dummies				✓	✓	✓
Observations	1238	1238	1238	1238	1238	1238

Note: Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
The placebo difference-in-differences estimates regressions with similar specification for
the 1999-2004 pre-quotas period.

Table S.14: Extended Difference-in-Differences Analysis: Placebo Test

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Post × quota tier	0.006	0.029	-0.009	0.006	0.028	-0.010
	(0.009)	(0.020)	(0.021)	(0.009)	(0.020)	(0.021)
Post × women	-0.023*	-0.007	-0.035*	-0.023*	-0.010	-0.036*
	(0.011)	(0.016)	(0.016)	(0.011)	(0.017)	(0.015)
Quota tier × post × women	0.020	-0.058	0.013	0.020	-0.056	0.014
	(0.024)	(0.068)	(0.034)	(0.024)	(0.069)	(0.034)
Individual controls	✓	✓	✓	✓	✓	✓
District dummies				✓	✓	✓
Year dummies				✓	✓	✓
Observations	1238	1238	1238	1238	1238	1238

Note: Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ The placebo difference-in-differences estimates regressions with similar specification for the 1999-2004 pre-quotas period.

7 Robustness Checks and Heterogeneity for 2SLS-IV Models

This section shows how the results presented in the main analysis are robust to the alternative specification of fixed effects 2SLS-IV models. For the robustness analysis of legislative outcome, the data is restricted to a panel dataset of two terms ($N = 420$) with a 6-year window (2005-2010). This is mainly due to two concerns. First, the passage data is only available for the bills proposed after the year 2001 in Taiwan's legislative records. Second, considering the average time of around 1 year for bills to be passed into law (and sometimes 2–3 years of sitting around after their introduction), excluding the recent years to avoid underestimation makes for a more robust analysis. This empirical test reduces the number of observations; however, it should not meaningfully alter the results.

One central concern from the main analysis is the issue of reverse causality, which would be the case if women who are interested in social policy issues were listed as quota women.

"Quota" is not randomly allocated. To address the reverse causality and selection bias concerns, I draw on entropy balancing on the instruments for the fixed effects 2SLS-IV analysis. In the fixed effects model, I did not include seniority and age as controls due to the post-treatment bias issue. Post-treatment bias occurs when controlling away the consequences of treatment (Gelman & Hill, 2012). Since being a quota legislator leads to more years serving the legislature (seniority), controlling for seniority will soak up the effect from the treatment. In the same vein, in the two-term data, quota women are on average 4 years older than the non-quota women; controlling for age will therefore lead to the similar bias.

The columns (1)–(6) in Table S.16 show that the results hardly change for the coefficient on quota women. Reassuringly, the results reported in Table S.17 for the coefficient on men electorally affected by quotas are unchanged. This strongly suggests that reverse causality and underestimation are not driving the results. The coefficient for non-quota women, however, is no longer significant at conventional levels. It is highly likely that it takes longer for the quota to have an influence on non-quota women to act on behalf of women compared to the immediate quota mandate effect on quota women. The coefficients of the control variables reveal some interesting patterns. Members from the majority party do not significantly influence the legislative outcome at the 95 percent confidence interval. Serving in the education committee is associated with a decrease in proposing welfare, health, and education issues.

Table S.15: Fixed-Effects with 2SLS IV Estimation on Legislative Outcome (2005-2010)

	First stage			Second stage			First stage			Second stage		
	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education	(7) Welfare	(8) Health	(9) Education	(10) Welfare	(11) Health	(12) Education
N. of welfare bills				0.704*** (0.072)						1.171 (0.748)		
N. of health bills					0.221* (0.087)						0.268+ (0.146)	
N. of education bills						0.600*** (0.131)						1.088+ (0.641)
Quota women	2.384*** (0.677)	3.672*** (1.009)	1.155** (0.369)									
Non-quota women							0.976 (0.858)	1.485* (0.624)	0.662 (0.647)			
Welfare committee	-1.705 (1.708)	0.259 (1.424)	-2.109+ (1.156)	0.934** (0.346)	-0.083 (0.178)	0.059 (0.366)	-0.914 (1.206)	0.815 (0.977)	-1.353+ (0.722)	1.258 (1.280)	-0.059 (0.126)	0.959 (1.043)
Education committee	-2.641* (1.199)	-3.354* (1.378)	-2.286*** (0.628)	-0.119 (0.307)	-0.875 (0.538)	-0.133 (0.392)	-0.809 (1.398)	-1.998 (1.231)	-0.876 (1.120)	-0.697 (0.869)	-0.534 (0.446)	0.252 (0.494)
Majority party	0.460 (0.468)	1.354* (0.549)	0.152 (0.289)	0.384** (0.141)	-0.166 (0.128)	-0.033 (0.093)	0.203 (0.581)	1.189+ (0.667)	0.490 (0.544)	0.384 (0.346)	-0.250 (0.260)	-0.081 (0.347)
KMT	-0.083 (0.601)	-1.231* (0.604)	-1.179** (0.446)	-0.117 (0.144)	1.061*** (0.127)	-0.097 (0.187)	0.852 (0.678)	0.733 (0.920)	1.362 (1.185)	-1.111 (0.910)	0.487** (0.155)	-1.085 (1.160)
N	420	420	420	420	420	420	420	420	420	420	420	420
Kleibergen-Paap F stat				12.385	13.250	9.771				1.293	5.668	1.048
Kleibergen-Paap LM Test p-value				0.149	0.143	0.145				0.271	0.072	0.329

Robust standard errors in parentheses.

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

8 Additional Test of Bill Proposals using the Short-term Panel Data (2005-2010)

Table S.16: Difference-in-Differences Analysis: Additional Test using the Short-term Panel Data (2005-2010)

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Quota tier	-0.014	0.001	-0.015	-0.014	-0.005	-0.007
	(0.029)	(0.020)	(0.012)	(0.030)	(0.019)	(0.013)
Post	-0.011	0.013	0.010^{+}	0.006	-0.015	0.003
	(0.011)	(0.009)	(0.005)	(0.020)	(0.013)	(0.010)
Post × quota tier	0.021	0.026	0.016	0.017	0.035^{+}	0.010
	(0.028)	(0.021)	(0.013)	(0.031)	(0.020)	(0.013)
Individual controls				✓	✓	✓
Year dummies				✓	✓	✓
Observations	420	420	420	420	420	420

Standard errors in parentheses

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

Table S.17: Extended Difference-in-Differences Analysis: Additional Test using the Short-term Panel Data (2005-2010)

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Post × quota tier	0.016	0.012	-0.000	0.016	0.021	-0.007
	(0.022)	(0.018)	(0.009)	(0.021)	(0.019)	(0.007)
Post × women	-0.015	-0.033	0.011	-0.005	-0.016	0.001
	(0.024)	(0.026)	(0.016)	(0.027)	(0.023)	(0.014)
Quota tier × post × women	0.026	0.059	0.021	0.009	0.041	0.031
	(0.052)	(0.046)	(0.029)	(0.055)	(0.042)	(0.027)
Individual controls				✓	✓	✓
Year dummies				✓	✓	✓
Observations	420	420	420	420	420	420

Standard errors in parentheses

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

9 Additional Test on 2SLS-IV

Table S.18: 2SLS-IV Estimation (1999-2018)

	First stage			Second stage		
	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
N. of welfare bills				0.554***		
				(0.113)		
N. of health bills					0.260***	
					(0.063)	
N. of education bills						0.243
						(0.240)
Men elected to the quota tier	0.544$^+$	1.920*	0.268			
	(0.301)	(0.747)	(0.186)			
Welfare committee	1.155***	2.967***	0.123	0.055	0.329$^+$	0.005
	(0.323)	(0.681)	(0.172)	(0.135)	(0.200)	(0.049)
Education committee	1.137***	1.256*	2.810***	0.064	-0.048	0.558
	(0.309)	(0.544)	(0.387)	(0.141)	(0.128)	(0.674)
Majority party	0.107	0.639*	0.115	0.003	-0.033	0.070
	(0.141)	(0.263)	(0.114)	(0.035)	(0.062)	(0.047)
Education	-0.019	0.614$^+$	0.036	0.069$^+$	0.009	-0.008
	(0.180)	(0.349)	(0.158)	(0.039)	(0.070)	(0.047)
KMT	0.701***	1.215***	0.212	-0.033	0.017	-0.018
	(0.177)	(0.309)	(0.131)	(0.083)	(0.084)	(0.063)
Age	-0.028**	-0.030$^+$	-0.018*	-0.002	-0.008*	-0.005
	(0.010)	(0.016)	(0.009)	(0.003)	(0.003)	(0.005)
Seniority	0.002	-0.005	-0.003	-0.006	-0.001	0.001
	(0.016)	(0.034)	(0.012)	(0.004)	(0.006)	(0.004)
N	2375	2375	2375	2375	2375	2375
Kleibergen-Paap F stat				3.266	6.608	2.073
Kleibergen-Paap LM Test p-value				0.083	0.017	0.163

Robust standard errors in parentheses.
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S.19: Fixed-Effects with 2SLS IV Estimation (2005-2010)

	First stage			Second stage		
	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
N. of welfare bills				0.609*** (0.123)		
N. of health bills					-0.099 (0.120)	
N. of education bills						0.601 (0.397)
Men elected to the quota tier	1.498* (0.686)	0.847 (0.645)	0.505 (0.581)			
Welfare committee	-0.376 (0.563)	1.029 (0.837)	-0.493 (0.412)	0.193 (0.230)	0.176 (0.329)	0.080 (0.195)
Education committee	-0.355 (0.963)	-1.393 (0.948)	-0.540 (0.768)	-1.019 (0.625)	-0.814 (0.524)	0.011 (0.310)
Majority party	0.190 (0.394)	0.874* (0.426)	0.764 (0.700)	0.192 (0.126)	0.122 (0.171)	0.030 (0.374)
KMT	0.038 (0.581)	0.199 (0.668)	-0.224 (0.935)	-0.225^{+} (0.128)	0.402^{+} (0.218)	-0.118 (0.209)
N	420	420	420	420	420	420
Kleibergen-Paap F stat				4.767	1.725	0.756
Kleibergen-Paap LM Test p-value				0.196	0.320	0.466

Robust standard errors in parentheses.
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Theoretically, there could also be a hindering effect on legislative outcomes. As reported in columns (4)–(6), the coefficient on *menelectedtothequotatier* is somewhat positive and significant. However, the low Kleibergen-Paap F figure indicates that the positive effect and significance of the instrument should be interpreted with caution. In sum, the results refute the concern with the hindering effect on legislative outcome. In line with the previous results on legislative initiative, men elected to the quota tier show no sign of hindering the enactment of welfare, health, or education issues.

10 Additional Analyses with Co-sponsorship Data

A related mechanism is that the effect of quotas on legislative initiative might work through co-sponsorship. Co-sponsorship is viewed as an inexpensive signal regarding the content of legislation at the outset of the legislative process (Wilson & Young, 1997). On the one hand, quota women will likely propose women-friendly social policy issues (and as the

Table S.20: Extended Difference-in-Differences Analysis with Co-sponsorship Data

	(1) Welfare	(2) Health	(3) Education	(4) Welfare	(5) Health	(6) Education
Post × quota tier	0.004	0.007	0.001	0.004	0.008[+]	0.003
	(0.004)	(0.005)	(0.004)	(0.003)	(0.005)	(0.003)
Post × women	-0.001	-0.003	-0.001	-0.001	-0.002	0.001
	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)
Quota tier × post × women	-0.008	0.005	0.008	-0.003	0.004	-0.001
	(0.006)	(0.010)	(0.006)	(0.006)	(0.009)	(0.005)
Individual controls	✓	✓	✓	✓	✓	✓
District dummies				✓	✓	✓
Year dummies				✓	✓	✓
Observations	2991	2991	2991	2991	2991	2991

Standard errors in parentheses

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

main sponsor). On the other hand, they might facilitate the initiative on similar issues by co-sponsoring and working together across party lines. I investigate this mechanism by re-estimating the regressions drawing on co-sponsorship data. Appendix S.20 presents the results with co-sponsorship on legislative initiative. The coefficients on the interaction terms are no longer significant and close to zero. It is therefore unlikely that the co-sponsorship can explain the effect of gender quotas.

Taiwan's electoral law states that a bill must meet a co-sponsorship threshold of at least 15 co-sponsors to be initiated. Considering the high number of co-sponsors, it is questionable whether legislators are committed to the bills they co-sponsored. Despite having a strong signaling effect, co-sponsorship is often considered as a common practice and has little impact on legislative success (Wilson & Young, 1997). It thus makes little sense to examine co-sponsorship for legislative outcome analyses.

References

Baumgartner, F. R., & Jones, B. D. (2002). *Policy dynamics.* Chicago: University of Chicago Press.

Gelman, A., & Hill, J. (2012). Data analysis using regression and multilevel/ hierarchical models. In (pp. 188–189). New York: Cambridge University Press.

Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, *20*(1), 25–46.

Hainmueller, J., & Xu, Y. (2013). Ebalance: A Stata package for entropy balancing. *Journal of Statistical Software*, *54*(7).

Wilson, R. K., & Young, C. D. (1997). Cosponsorship in the US congress. *Legislative Studies Quarterly*, 25–43.

Paper 3

Global Diffusion of Gender Quotas, Women's Legislative Presence, and Social Spending

Global Diffusion of Gender Quotas, Women's Legislative Presence, and Social Spending[*]

Suen Wang

Abstract

Understanding quota diffusion, and how quotas and an increasing women's legislative presence translate into government spending are central to the study of gender and politics, yet this multifaceted process is underexplored. In this study, I draw on an original panel dataset of 153 countries from 2000 to 2016. First, I assess an uninvestigated explanation of quota origin and demonstrate that international development assistance has a moderating effect on the relationship between women's political rights and quota implementation. Subsequently, I discern the effects of the legislative presence of women and quotas on social spending. Using linear panel and panel threshold models, I find that increasing legislative presence of women has a linear effect on the expansion of overall government size and the linear and threshold effects on the expansion of health spending. Leveraging generalized difference-in-differences analysis, I find that quota implementation, rather than adoption has a significant positive effect on health spending. This effect is appreciably strong for the reserved-seat quotas. These findings raise important insights for policymakers. The findings highlight the role of development assistance in quota diffusion and the multifaceted impact of women's legislative presence and quotas on government spending priorities.

Introduction

To date, more than 130 countries have implemented legislative gender quotas in the form of voluntary party quotas, candidate list quotas, or reserved seats. Quotas largely changed the composition of legislative assemblies by increasing the share of women. The questions of why quotas are diffused worldwide, and the implications of quota diffusion have intrigued scholars for the past decade (Bush, 2011; Clayton & Zetterberg, 2018; Franceschet & Piscopo, 2008; Hughes, Krook, & Paxton, 2015). Nevertheless, the global diffusion of quotas presents a puzzle because the significant majority of quotas have been implemented in the developing world (Bush, 2011), where women seem to have a lower level of representation and fewer guaranteed political rights.[1] Under these conditions, to what extent, and in what way, do women's political rights explain the implementation of gender quotas? Do gender quotas, or increased women's legislative representation affect social spending and total spending outcomes?

These questions are crucial on empirical and theoretical grounds. Empirically, a growing number of studies have generated important evidence on the relationship between quotas and government outcomes (Clayton & Zetterberg, 2018; Franceschet & Piscopo, 2008; Geys & Sørensen, 2019), but there is a lack of attention to the mechanism underlying quota implementation. It is important to probe this mechanism because it is plausible that quota implementation is a function of certain domestic and international factors that may relate to government priorities. Moreover, most of the studies focus on quotas, which overlook the numeric change in women's legislative representation. There are few studies using the quota "depth" or "level" to measure the magnitude of the change in women's legislative presence (e.g., Clayton & Zetterberg, 2018), which provides an informative quota measurement. However, the role of women's legislative presence in comparison with the role of quotas on social spending remains largely untested.

From a theoretical perspective, existing explanations of quota implementation have pri-

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[1]Appendix Figure S.2 maps out the quota implementation worldwide. As shown in the map, gender quotas—particularly, legal quotas (reserved-seat and candidate list quotas)—have been implemented primarily in developing countries.

marily focused on domestic and international factors. Theories of norm diffusion and world polity argue that new policy implementation is motivated by a combination of domestic and international factors, where international organization often plays a significant role (Finnemore & Sikkink, 1998; Keck & Sikkink, 1998; Meyer, Boli, Thomas, & Ramirez, 1997). However, what about quota implementation in countries where women's political rights are not guaranteed by law and policy? International organizations advocating for women's movements are often constrained in developing countries with nonconsolidated democratic systems where gender inequality persists. How is it possible that quotas can be introduced in the countries where women's participation in public and political life is still resisted?

Furthermore, the "critical mass" theory of gender and politics indicates that increasing the proportion of women legislators is not likely to impact legislative priorities (inter alias, social policy) until the proportion reaches a certain threshold (Thomas, 1991; Thomas & Welch, 1991; Yoder, 1991). However, this explanation hinges on key assumptions that are not theoretically elucidated (Beckwith & Cowell-Meyers, 2007) or empirically substantiated. First, the underlying mechanism is unclear. It could be, as the critical mass theory hypothesizes, that increasing the women's presence leads to certain legislative outcomes. It is also conceivable that other mechanisms drive the effect: quotas could generate a mandate effect for quota women to exert their preferences on legislative outcomes (Franceschet & Piscopo, 2008). Moreover, as Beckwith and Cowell-Meyers (2007) wrote, "research employing critical mass as a concept has not clarified the process by which sheer numbers of women might work to advance women's substantive representation." There is a need for a clearer understanding of such threshold mechanisms. Second, although past studies have drawn on several threshold values[2] as indicators to assess whether a substantial increase in women's numeric representation leads to a change in policy priorities (Matland & Studlar, 1996; Thomas, 1991; Thomas & Welch, 1991), no critical threshold value has been empirically identified. Furthermore, some existing studies have presented no evidence regarding such a

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[2]These threshold values, for instance, include 15–30%.

critical mass effect (Cowley & Childs, 2003; Dahlerup, 1988; Lovenduski, 2001). One potential reason for the mixed evidence is that investigating the legislative presence of women alone is insufficient to explain its effect on policy outcomes.

To address these empirical and theoretical challenges, I first explore the conditions for quotas by testing the effects of development assistance on quota implementation at different levels of women's political rights. This approach aligned with the literature that highlighted the importance of the interaction between domestic and international factors (see, Krook, 2006). Rather than theorizing that development assistance is positively related to quota implementation, I advance the theory by adding that women's political rights are crucial conditioning factors in this process because the signaling role of development assistance is unlikely to hold equally for countries with different levels of women's political rights. In a second step, I develop a theoretical argument regarding the effects of women's descriptive representation and gender quotas on social spending. Following studies emphasizing the need to identify the critical threshold value (Dahlerup, 1988; Lovenduski, 2001) and to unpack the black box of a threshold mechanism for the link between women's numeric representation and their influence on policymaking (Beckwith & Cowell-Meyers, 2007; Crowley, 2004), I use the threshold model to generate the cutoff value and to probe a threshold relationship between women's presence and public spending on health and education. Empirically examining the critical mass hypotheses on the macro level adds a new approach in the literature of gender and politics. Furthermore, in addition to assessing a threshold effect and building on the study by Clayton and Zetterberg (2018), I draw on a set of generalized difference-in-differences models to explore the impact of gender quotas. I aim to distinguish an increased presence of women and gender quotas as two distinct mechanisms for impacting the change in government social spending priorities.

The empirical implications of the expectations are tested with original panel data for 153 countries from 2000 to 2016. The paper contributes to the research on the quota diffusion and the social spending implications of quotas and an increased women's presence. First, by going beyond the well-researched conventional explanations of global quota diffusion, such

as using international organizations as a major explanatory factor, the findings provide new evidence that indicates women's political rights can theoretically moderate the implementation of quotas in a meaningful way. Although one could argue that countries strategically implement gender quotas to signal modernity and to attract more international aid, my findings reveal that this is only one side of the story. For countries with higher levels of women's political rights, more assistance is associated with an increase in the probability of implementing quotas. However, more development assistance significantly lowers the probability of quota implementation in countries with lower levels of women's political rights.

Second, this paper provides the first quantifying insight on testing the critical mass theory in gender and politics by substantiating a threshold mechanism. The findings show that a mechanism for women's numeric representational threshold exists for its impact on health spending. This result empirically sheds light on the process in which the sheer proportion of women translates into women's substantive representation for social spending. Further, the findings suggest that the increased legislative presence of women leads to the expansion of health and total government spending in a linearly proportional way. This finding suggests that the increased legislative presence of women on health spending could derive from an overall increase in the size of government due to an increased proportion of elected women. Finally, the analysis also adds to the literature on the effect of gender quotas on budgetary priorities. In particular, the analysis suggests that quota implementation—instead of adoption—impacts health spending, whereas it has no significant effect on education or total government spending. Moreover, the findings point to the crucial role of a specific type of quotas, reserved-seat quotas, in this process. By providing novel evidence on the roles of women's legislative presence and gender quotas on government spending, this study unpacks mechanisms that corroborate some gaps in the literature.

Domestic Women's Political Rights, International Development Assistance, and Quota Diffusion

From a theoretical perspective, prominent explanations of quota introduction have primarily focused on domestic and international factors. At the international level, theories of world polity argue that many characteristics of modern nation-states are embedded in the world polity, where international organizations play a pivotal role in stimulating cross-national associational processes, through which global "policy scripts" are diffused (Boli & Thomas, 1997; Meyer et al., 1997; Ramirez, Soysal, & Shanahan, 1997). Theories of revised modernization argue that gender equality is accompanied by improvement in socioeconomic conditions (Inglehart & Norris, 2003; Inglehart & Welzel, 2010). As societies shift toward industrial or post-industrial stages, women participate in labor and higher education. Concurrently, some policies, in particular social policies, are made to promote gender equal opportunities in the public sphere. At the domestic level, studies have identified roles of the coalition (Kang & Tripp, 2018), women's activism (Tripp, 2012), and women's mobilization and movement (Badri & Tripp, 2017) as crucial explanatory factors for quota adoption. Theories of norm diffusion have argued that new policy innovation is motivated by a combination of domestic activism and international stimulus (Finnemore & Sikkink, 1998; Keck & Sikkink, 1998).

Other studies have added a more nuanced layer to this conventional wisdom, suggesting that domestic factors do not merely combine with international trends. Krook (2006), for instance, argues that the ways domestic and international actors influence quota implementation take multiple configurations, including details of quota measures, institutional frameworks, and the balance of actors supporting and opposing quotas. In the words of Hughes et al. (2015), international and domestic factors do not often positively interact because domestic actors may "reject or transform the messages being transmitted from above." However, what about quota implementation in countries where women have lower levels of political rights? Practically and politically, international organizations advocating

for women's movements are often constrained in nondemocratic countries. How is it possible that quotas can be introduced in countries where women's participation in public and political life is still prohibited? The theoretical argument I propose here moves away from the "top-down" or "bottom-up" logic of motivation for quota introduction. As existing studies show that in the settings where women's movement and civic activism are controlled, the quota policy barely derives from civil society (Dahlerup, 2006; Donno & Kreft, 2019; Tripp & Kang, 2008). Beyond the world polity and norm diffusion framework (Keck & Sikkink, 1998) and in line with the growing literature on the multifaceted interaction processes between the domestic and international factors (Hughes et al., 2015; Kang & Tripp, 2018; Krook, 2006), the theory proposed here expands on the specific role of women's political rights. It focuses on the effect of development assistance as an international stimulus, which potentially creates a pathway to quota adoption.

Although developed countries are increasingly allocating development assistance to gender-related projects (Agerberg & Kreft, 2020), the development assistance effect on gender equality is often mixed in the literature. On the one hand, research has shown the positive effect of development assistance on the commitment to gender equality. For instance, drawing on a field experiment in Afghanistan, Beath, Christia, and Enikolopov (2013) find that the development program was associated with an increase in women's political participation. Using panel data from 13 MENA countries, Baliamoune-Lutz (2016) finds that official development assistance has a positive impact on women's political empowerment. On the other hand, critics of development assistance have argued that foreign aid dependence may send a strong signal to countries that received assistance to comply with global gender norms by adopting quotas "in order to reap material (foreign aid) benefits from a positive international reputation" (Edgell, 2017). Moreover, some have argued that the implicit role of assistance to strengthen the government sector is potentially inimical to civil liberty, including women's rights (Friedman, 1995; Knack, 2004). Along these lines, others have argued that aid has little effect on government accountability (Bräutigam, 1992; Tilly, 1992) and institutional quality (Bräutigam & Knack, 2004). The notion that aid can fa-

cilitate accountability is conditional on accountability to international donors rather than domestic taxpayers (Bräutigam, 1992).

One possible explanation for the mixed evidence and divergent arguments regarding the development assistance effect on the commitment to gender equality is that scholars model these processes and estimate underlying mechanisms in various ways (Wright, 2009). Most studies treat development assistance as having a linearly proportional, rather than differential, effect on gender equality. However, the signaling role of development assistance is unlikely to hold equally for all countries, for instance, in countries with different levels of women's political rights. Instead of theorizing that development assistance is always positively related to quota introduction, the theory is proposed by adding that women's political rights are an important conditioning factor in this regard.

Women's political rights correspond to the rights to vote, petition, run for office, and hold government positions. When political rights and civil liberties increase, it is more effective to pursue better policy changes concerning women's interests through domestic and international activism (Paxton, Hughes, & Painter, 2010). As women's participation in formal politics increases, the implementation of institutional regulations, such as gender quotas, will be more in demand in the political process. In the same vein, a higher level of women's civil liberties is associated with a more effective international stimulus (Paxton et al., 2010). It is reasonable to believe that, as women's political rights increase, international development assistance will have an increasingly positive effect on quota implementation. In circumstances where women's political rights are more restricted, international development assistance may have limits on implementing quotas because commitment to liberal values is fundamentally restrained in these situations. In contrast, in environments where women's political rights are more guaranteed, international development assistance is positively associated with quota implementation. The above theoretical arguments lead to the following observable implications:

Hypothesis 1 Quota Implementation Hypothesis :

Greater political rights for women are associated with an increasingly positive effect of international development assistance on the probability of quota implementation.

Women's Legislative Presence, Gender Quotas, and Social Spending

After theorizing the factors leading to quota implementation, I theoretically connected the links between legislative presence of women and quota implementation on social spending. Kanter (1977) has developed a critical mass argument of token women in an organization as vulnerable to group pressure in the "predominantly male culture" until the proportion of women reaches a threshold of 15%. Scholars have applied Kanter's argument to the setting of women in politics (Saint-Germain, 1989; Thomas, 1991, 1994; Thomas & Welch, 1991) and have argued that, when women's legislative presence increases, women will be able to better advocate for their political agendas. Saint-Germain (1989), for instance, finds that, as the proportion of women increases in the Arizona legislature, the enactment rate of the bills that are traditionally feminine issues also increases. Moreover, Thomas (1991, 1994) provides plentiful quantitative evidence on the policy implications of the increasing number of women in 12 state legislatures in the United States. She shows that, in the states with higher percentages of women legislators, legislation associated with women, child-care, and families is more prioritized.

Arguably, there is little reason to believe that a critical threshold is a magical panacea. In practice, as Dahlerup (1988) wrote, "human beings do not act automatically like particles." It is difficult to gauge the sudden facilitation of the change in policymaking based on exceeding the value of a critical threshold. This question brought the debate to the fore on a critical mass approach applied in gender and politics. Criticism of this approach has centered on the lack of identification for a critical threshold value (Matland & Studlar, 1996; Thomas, 1991) and unclear substantiation of an empirical process where an increased

number of women can translate into legislative change (Beckwith & Cowell-Meyers, 2007; Dahlerup, 1988). These critiques might be one explanation for why some existing studies document no evidence regarding a critical mass effect for women in politics (Carroll, 2001; Cowley & Childs, 2003; Lovenduski, 2001; Studlar & McAllister, 2002). Using cross-sectional data based on 20 industrialized democracies for 50 years, Studlar and McAllister (2002) find that gain in women's representation is an incremental process, rather than a threshold accelerating process. Carroll (2001) argues that more women being elected might be accompanied by an increase in party discipline and subsequent partisan division among women. Based on the context of the 1997 British general election, where an unprecedented number of women entered parliament, Lovenduski (2001) and Cowley and Childs (2003) find that a large rise in the number of women results in an increase in loyalty to the party rather than a focus on self-interest. Consequently, a sheer increase in the number of women may be related to fewer women elected to advocate for women's interests.

One potential explanation for the competing evidence is that the models built on critical mass theory do not additionally consider alternative mechanisms, such as gender quotas.[3] The increased presence of women may result in an emphasis on women's policy priorities, and quotas, when applicable, could motivate such an effect. I account for a quota mechanism as an alternative driving factor in this process.[4] As elected women increase, not all women may represent women's concerns: quota policy may particularly generate a quota mandate effect for quota women to act on the behalf of women (Franceschet & Piscopo, 2008); however, the same quota effect may not hold for all. In this regard, gender quotas can also lead to a

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[3]The other explanations, for instance, include the issue of external validity. Studies by Lovenduski (2001) and Cowley and Childs (2003) draw on the case of the 1997 British general election. It remains a question of how their findings can travel beyond that specific context.

[4]Research often combines gender quotas and the legislative presence of women as a single concept. There are, however, potential drawbacks to this operationalization. Appendix Figure S.4 illustrates that, as legal quotas were largely implemented worldwide, the average percentage of legislative seats held by women only increased slightly by approximately six percentage points from 2000 to 2016. Moreover, as presented in Appendix Figures S.2 and S.3, women's legislative presence and quota implementation also show spatially distinctive patterns. While ecological fallacy might be a concern when inferring from the general to the specific, these patterns, tap into some differences between women's legislative presence and gender quotas on a very descriptive and aggregate level.

change in government outcomes. At the macro level, Clayton and Zetterberg (2018) provide the first comprehensive comparative analysis of the effect of the quota on public spending. They find that quota policies impact government spending priorities in historically feminized policy issues, such as public health.

Existing literature has well related these social policy areas as women's policy interests. For instance, based on the Latin American context, Schwindt-Bayer (2006) finds that elected women are more likely to initiate health and education issues than their male colleagues are. Bratton and Ray (2002) find that an increased number of women in politics is positively associated with the childcare provision in Norway. Drawing on a similar case in India, Clots-Figueras (2012) finds that health and education are the policies that women prioritized. Despite a plethora of studies focused on the effect of women's representation and gender quotas on social policy issues, a similar effect on social policy spending is largely under-researched. However, as Clayton and Zetterberg (2018) argue, government spending is an indication of legislators' preference and impact, at least to some degree.[5] For this reason, the budgetary implications can be a highly interesting outcome. Furthermore, in line with previous studies (Clayton & Zetterberg, 2018), I distinguished between quota adoption and quota implementation. This distinction is not trivial because it is often the case that quotas are adopted but never implemented. Moreover, this distinction allows researchers to address a crucial endogeneity issue: The quota effect may already exist after they are first adopted because quotas can be endogenous to the change in the political climate, which contributes to policymaking outcomes (Clayton & Zetterberg, 2018).

Additionally, the types of quotas can be expected to matter. Gender quota can be mainly defined as one of three types. (1) Voluntary political party quotas are not mandated by law

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[5]According to Clayton and Zetterberg (2018), quotas and an increased presence of women may first influence spending priorities when the budget proposals are drafted through negotiation. Next, the two factors influence the collective bargaining and decision-making during "legislature's review of the budget proposal" within committees and during "legislative procedures to approve, reject, or amend the proposal" (Clayton & Zetterberg, 2018). As women increase their legislative presence, more women will sit in the budget-planning committees (Michelle Heath, Schwindt-Bayer, & Taylor-Robinson, 2005). The negotiation power of women to represent women may also increase if women obtain leadership positions (O'Brien & Rickne, 2016).

and are adopted internally by political parties regardless of whether there is a legal quota. (2) Candidate list quotas occur when the quota rule is mandated by law and requires each political party to have a particular share (e.g., 40%) of women on the candidate list. (3) Reserved-seat quotas occur when the number of women elected is regulated and mandated by law (International IDEA, 2019). Based on this definition, reserved-seat quotas, a quota mandate that sets aside a certain proportion of seats for women, are often considered as reasonably effective in increasing the presence of women (Paxton & Hughes, 2015). Moreover, candidate list quotas are viewed as effective when they are implemented with a placement mandate and enforcement system (Schwindt-Bayer, 2009).

However, debates have emerged and centered on whether different types of quotas are effective in representing women. Issues stem from the variation in the minimal thresholds regarding the effectiveness of the reserved-seat quotas (Krook, 2014). For instance, in Burundi's national assembly, 30% of the seats have been reserved for women since 2005. However, in Jordan's lower house—House of Representatives—a quota provision of only 5.45% of seats were reserved for women when the quota was first introduced in the 2003 election (International IDEA, 2019). Moreover, almost all of the reserved-seat quotas have been adopted in the developing world, notably in the Middle East, Africa, and South Asia (Dahlerup, 2007). Democracies in these regions do not exist or are less consolidated. Similar issues have also arisen for candidate list quotas and political party quotas. Compulsory candidate list quotas might result in noncompliance or parties, placing women toward the bottom of the list (Tripp & Kang, 2008). While some large and even ruling parties have implemented voluntary party quotas, notably the Swedish Social Democratic Party (50% zipper quotas on the candidate list) and the Christian Democratic Union of Germany (30%), voluntary party quotas are more popular among smaller parties (such as green or leftist parties) with few members elected in legislative bodies (Krook, 2014). In addition to assessing the overall effect of quotas, this paper further probes if the quota argument holds for different types of gender quotas. These expectations lead to hypotheses 2 and 3:

Hypothesis 2 Women's Legislative Presence and Critical Mass Hypothesis:

An increase in women's legislative presence is associated with an increase in public health, education, and total spending. Moreover, women's legislative presence is not likely to influence these spending outcomes until the percentage of elected women reaches an identifiable critical threshold.

Hypothesis 3a Quota Hypothesis:

Quotas lead to an increase in public health, education, and total spending. Moreover, the increases are more likely after the quotas are implemented, rather than after adoption.

Hypothesis 3b Quota Strength Hypothesis:

The reserved-seat quotas have the strongest effect on the spending outcomes than any other quota type.

Data and Variables

For the analysis, I draw on an original balanced panel dataset, including 153 countries from 2000–2016.[6] I excluded small countries with populations less than 1 million due to completely missing data.[7] Nor did I include countries with an absence of legislative assemblies due to coups or wars.[8] The post-2000 period is preferable in examining quota implementation, an increased presence of women, and their implications because this period saw a large global increase in quota implementation and seats held by women in legislative assemblies.[9]

My first outcome variable to explore quota introduction pathways (hypothesis 1) is quota

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[6]Appendix section 8 lists all the countries in the sample.

[7]These small countries include Antigua and Barbuda, Belize, Cape Verde, Djibouti, Dominica, Kiribati, Liechtenstein, Maldives, Malta, Marshall Islands, Micronesia, Monaco, Montenegro, Samoa, São Tomé and Príncipe, San Marino, Seychelles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Tonga, Tuvalu, and Vanuatu.

[8]The countries that have missing data or have experienced coups or civil wars during the period include Afghanistan, Bosnia and Herzegovina, Eritrea, Sierra Leone, Somalia, Somaliland, United Arab Emirates, and Zanzibar.

[9]For example, according to IPU (2015), the percentage of women in parliaments worldwide increased from 13.1% to 22.1% between 2000 and 2015 on average. The number of legal quotas (reserved-seat and candidate list quotas) increased from 25 in 2000 to 75 in 2015 (Hughes, Paxton, Clayton, & Zetterberg, 2019).

implementation, which is gauged in the form of a binary variable denoting whether a country has implemented quotas. The focus lay on quota implementation instead of adoption to capture the distinctive lagged nature of quota introduction. Further, if a country has strategically adopted quota as a symbolic gesture to signal modernity and receive aid, the causal directions may go both ways. Examining quota implementation instead of adoption rules out the possibility that the results are not completely driven by such reverse causality. In most cases, the quota policy takes immediate effect after adoption from the next election cycle. In other cases, it takes many years to implement the quota properly (e.g., Armenia, South Korea, Paraguay, and Uruguay). Alternatively, some quotas were never enforced as expected, often due to a lack of sanctions for noncompliance (e.g., Brazil and Cameroon). For these reasons, the measure of quota implementation is more relevant than quota adoption.

To assess the budgetary implications of quotas and women's representation (hypotheses 2 and 3), I generated health, education, and total spending as the second set of outcome variables. Health and education spending are coded as a percentage of general government spending by using information from World Development Indicators (WDI). This measurement accounts for the possibility that the results are not picking up the trend in overall government spending. In addition to health and education spending as outcome variables, I generated total spending, measured as overall government spending, as a percentage of GDP, which aims to capture whether gender quota and the increasing representation of women expands the size of the government overall.

The first set of explanatory variables include women's political rights and official development assistance. Women's political rights are measured using the 4-point Cingranelli-Richards (CIRI) scale developed by Cingranelli, Filippov, and Mark (2018). On the aggregate level, the women's political rights score measures women's rights to vote, petition, join parties, run for office, and hold government positions (Cingranelli et al., 2018). The score assesses the extent to which women's political rights are guaranteed by law and practice. The countries received a score of 0 (none) if rights were not guaranteed, 1 (low) if severely

prohibited, 2 (medium) if moderately prohibited, and 3 (high) if guaranteed. Overall, the score reasonably captures the distinct nature of women's political rights based on law and practice rather than the domestic gender norms and social changes that are unobservable and difficult to interpret.

Development assistance was standardized and coded as a lagged value of net official development assistance as GDP percentage by using information from WDI to test the moderating effect of official development assistance. Subsequently, I test the budgetary implications of quota policy. Based on the data from International IDEA (2019) and the QAROT data by Hughes, Paxton, Clayton, and Zetterberg (2017), I coded quota implementation and adoption as two binary variables to differentiate these two distinct quota introduction processes. Appendix section 8 lists the year the quota is implemented and adopted for each country in the sample during the period. Quota implementation was coded as a 1 if there was enforcement or a placement mandate to ensure full compliance with quota adoption. There are 11 cases in my sample where quotas are not implemented properly in the following electoral cycle.[10] In the circumstance where a voluntary political party quota is present, I only include the cases when quota adopted parties held more than 30% of the legislature seats in a given year, which is in line with previous studies (see, e.g., Clayton & Zetterberg, 2018; Rosen, 2017). In the next step, to tap into the effect of each quota type, three binary variables were coded denoting the implementation of voluntary party quota, candidate list quota, and reserved-seat quota. To avoid measurement error, I only counted cases as voluntary party quotas if the parties that implemented the quotas were neither dominant nor small. Consistent with previously mentioned criteria, I coded the implementation of voluntary political party quota, excluding the cases where one or more parties that implemented a quota in a given year did not reach more than 30% of the legislature seats. This coding process is meaningful because the use of voluntary party quotas by smaller parties is symbolic and cannot yield any significant implications. In the next step, I excluded the cases where parties were too dominant. Consistent with the criteria

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[10]These 11 cases include Armenia, Brazil, Cameroon, Colombia, DR Congo, Republic of the Congo, Côte d'Ivoire, Eswatini, Guinea, Haiti, and Liberia.

developed by Bush (2011), I excluded those cases where the quota was implemented by a powerful party in a noncompetitive electoral system and counted them as reserved seats.[11]

As with observational data, endogeneity concerns often arise. The most obvious concern is omitted variable bias, which would be the case if certain country-level characteristics could influence quota implementation and public spending. Lack of control for these characteristics result in biased estimates. To isolate the effect, I include several important economic, political, and demographic controls that may influence quota implementation and government spending. The economic controls include GDP, trade openness, foreign direct investment, and oil rents, all natural logarithm transformed with a one-year lag and retrieved from WDI. The demographic control consists of the female unemployment rate (ILO estimate). These economic and demographic controls likely affect the outcome. Crucially, one would expect that government spending on social policy issues to be lower in countries with less economic prosperity and openness (Avelino, Brown, & Hunter, 2005). Furthermore, a country's female unemployment rate may be correlated with the likelihood of implementing policies that improve gender equality (Kittilson, 2008).

As for the political-institutional covariates, I first include a host of political regime controls using information from polity IV. Binary variables democracy and autocracy are added to capture the political regime's impact. To account for more varied regime patterns instead of the simplistic dichotomy of democracy and autocracy, I include accumulated autocracy experience, measured by the total number of years a country had experienced autocracy from the end of the Second World War (1945). The literature has established well the importance of regime patterns on social spending. Stasavage (2005), for instance, finds that democracies spend significantly more on health and education than autocracies. Moreover, I account for the influence of electoral rules and the leftist ruling party, based on information from the recent version of the political institution database (Cruz, Keefer, & Scartascini, 2018). Specifically, majoritarian and proportional representation are included in

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[11]The cases of a single dominant party in a noncompetitive political system include Burkina Faso's Congress for Democracy and Progress before 2014. The party remained the single dominant party until the emergence of the opposition party in 2014 and implemented a party quota in 2002.

the controls to account for the difference between two major electoral rules; leftist is included to denote if a country had a left-leaning ruling party. It is crucial to control for the leftist ruling party to avoid the overestimation of the quota effect because leftist parties are likely to send more women to the legislature (Kittilson, 2008). Furthermore, political corruption index and the presence of UN peacekeeping are added as additional political controls. The political corruption index (ranging from 0 to 1) is retrieved from Varieties of Democracy (2019). It is important to control for political corruption for the development assistance effect on quota implementation based on different levels of women's political rights because development aid may end up funding corrupt leaders in countries with a high level of political corruption. The presence of UN peacekeeping is a binary variable and is coded according to the existence of the operation, force, mission, group, and transitional administration in a given year. The presence of UN peacekeeping represents the international involvement force and is often related to quota introduction (Bush, 2011). Finally, I follow Finkel, Pérez-Liñán, and Seligson (2007) and constructed a binary variable of advanced industrial democracy to capture the difference between the developed and developing world. [12] Online appendix tables S.1-S.4 provide a detailed discussion on the construction and descriptive statistics of these variables.

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[12]I used the criteria proposed by Finkel et al. (2007) and classified countries as advanced industrial democracies if they fell into the following criteria during 2000–2016: (1) They were defined as high income by World Bank. (2) They had an overall Freedom House score lower than 3. (3) They were independent countries. (4) They did not receive any USAID.

Analysis

International Development Assistance, Domestic Women's Political Rights, and the Spread of Quotas

I start by examining the explanatory factors of quota implementation. Table 1 presents the results of the two logistic regressions. All models include a series of economic, political, and demographic controls. This analysis excluded preexisting quota implementation to make a more robust analysis. Model 2 tests Hypothesis 1 by showing a significant positive interaction effect between women's political rights and official development assistance (ODA). Moreover, adding the interaction effect improves the model fit, represented by decreases in both AIC and BIC from Model 1 to Model 2. The model fit improvement indicates that the effect of development assistance differs strongly over different levels of women's political rights, lending support to the belief that adding interaction yields meaningful findings. The significant positive interaction suggests that development assistance is increasingly and positively associated with quota implementation as assistance increases.

Table 1: Logistic Regressions of Quota Implementation

	(1) Simple	(2) Interaction
Women's political rights	2.132***	2.744***
	(0.319)	(0.372)
ODA	-0.978***	-6.145***
	(0.250)	(1.175)
Women's political rights $\times$ ODA		2.374***
		(0.515)
Log of FDI	0.209*	0.195+
	(0.094)	(0.109)
Female unemployment rate	-0.059+	-0.068*
	(0.030)	(0.031)
Leftist ruling party	-0.680*	-0.678*
	(0.291)	(0.293)
Proportional	3.525***	3.781***
	(0.870)	(1.016)
Majoritarian	0.460	0.468
	(0.667)	(0.748)
Democracy	2.882**	1.005
	(1.040)	(0.844)
Autocracy	-2.414**	-3.203**
	(0.924)	(1.057)
Political corruption	-12.764***	-16.360***
	(2.271)	(2.536)
UN Peacekeeping	-2.466**	-4.345***
	(0.852)	(1.240)
Time and Country FE	✓	✓
AIC	574	550
BIC	627	608
Prob $> \chi^2$	0	0
Observations	884	884

Standard errors in parentheses
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1: Marginal Effects of ODA on Quota Implementation (Based on Model 2 in Table 1)
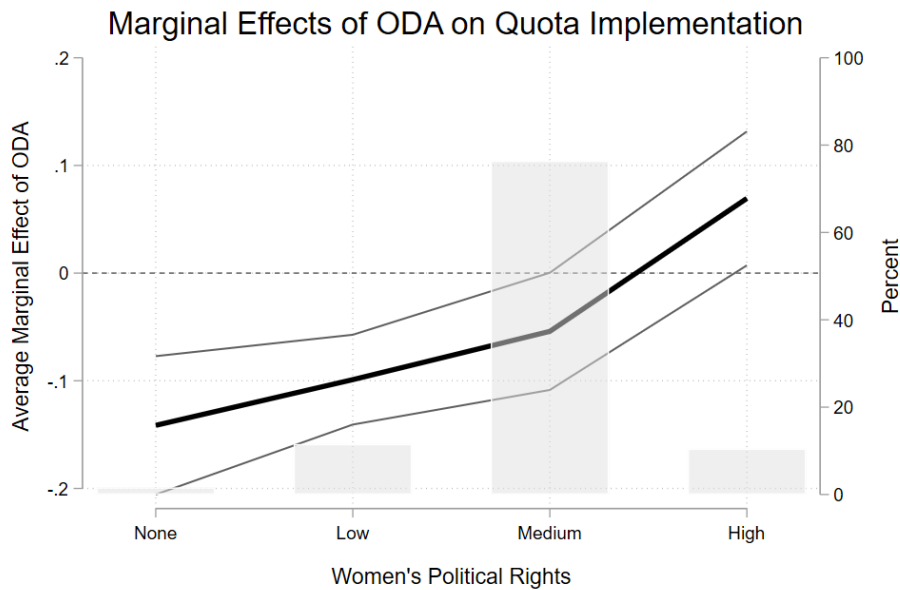
Note: The figure shows the marginal effects of the received official development assistance (percentage of GDP) on quota implementation. The histogram indicates the observation shares. The marginal effects are shown with 95% CI.

Table 2: Predicted Probabilities of Quota Implementation (%)

Women's Political Rights	No Assistance	Average Assistance
None	18	17.5
Low Level	28.4	28.1
Medium	45	45.3
High Level	66.3	67.4

Note: This table does not include high assistance due to the concern that it was rarely received for countries with high levels of women's political rights, and therefore including it may bias the prediction.

To interpret the moderated effect of assistance and to reveal the pattern of the positive interaction effect, I provide a marginal effect plot at varied levels of women's political rights. Figure 1 suggests a similar effect with Table 1, where assistance has a significant negative marginal effect for countries with a lower level of women's political rights. However, the effect turns significantly positive for countries with high levels of women's political rights. For countries with high levels of women's political rights, one unit of increase in development assistance increases the probability of quota implementation by 7%. Moreover, for

these countries with high levels of women's political rights, no received assistance has a 66.3% predicted probability for quota implementation, while average assistance has a 67.4 % predicted probability for quota implementation. In contrast, the marginal effect of assistance is significantly negative for countries with low levels of women's political rights. At a low level, no assistance has a 28.4% predicted probability for quota implementation, while average assistance has a of 28.1% predicted probability for quota implementation. Table 2 presents the predicted probabilities for countries with different levels of women's political rights with no assistance and with average assistance. The results here address the issue of no development assistance by revealing that the findings for countries that received no assistance are in line with the theoretical expectation of higher women's political rights and higher probabilities of quota implementation. Importantly, this indicates that the results are not motivated by variation in assistance distribution. There is no evidence that the interaction effect only holds when there is development assistance provided. Notably, this table does not include high assistance due to the concern that development assistance is rarely received for countries with high levels of women's political rights; therefore, including it would potentially bias the predicted estimates.

Overall, the findings largely support Hypothesis 1 and are aligned with theories developed on the moderating role of development assistance based on women's political rights. The relationship between development assistance and quota implementation differs significantly dependent on different levels of women's political rights. At higher levels of women's political rights, assistance is significantly related to a higher probability of successful quota implementation. Similar findings exist when the sample is restricted to less developed countries (Appendix Figure S.5). [13]

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[13]The sample is restricted to less developed countries by excluding the advanced industrial democracies. Notably, when the sample is restricted, the effects of development assistance on quota implementation on lower levels of women's political rights are negative but no longer significant. The insignificance is likely due to a smaller sample.

Does the Legislative Presence of Women Matter? Women's Legislative Presence, Representation Threshold, and Social Spending

Having demonstrated that the interplay between development assistance and women's political rights incentivizes quota implementation, I probe the effects of women's legislative presence on government spending based on linear and threshold models. First, I assess the effect of women's legislative presence on government spending by using a simple linear fixed-effects model. The model specification is as follows, where for each country i in year t, Y_{it} is the dependent variable denoting health, education, and total spending; X_{it} is the regressor denoting women's legislative presence—the proportion of women in the legislature; μ_{it} is a vector of conditioning factors; and ε_{it} is an error term.

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \mu_{it} + \varepsilon_{it} \tag{1}$$

Second, I assess a similar effect by drawing on the panel threshold model. The model allows for empirical substantiation of the critical mass argument—if women's increasing legislative presence affects spending priorities when the proportion of elected women reaches an identifiable critical threshold. I estimate the threshold effect with a panel threshold model developed by Hansen (1999). The model specification is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} I(q_{it} \leq \gamma) + \beta_2 X_{it} I(q_{it} > \gamma) + \mu_{it} + \varepsilon_{it} \tag{2}$$

where $I(\cdot)$ is the threshold indicator function, which equals 1 if the statement in parentheses is true and equals 0 otherwise. Alternatively and intuitively, the specification can be written as

$$Y_{it} = \begin{cases} \beta_0 + \beta_1 X_{it} + \mu_{it} + \varepsilon_{it}, & q_{it} \leq \gamma; \\ \beta_0 + \beta_2 X_{it} + \mu_{it} + \varepsilon_{it}, & q_{it} > \gamma. \end{cases} \tag{3}$$

For each country i in year t, Y_{it} is the dependent variable denoting health, education, and total spending; X_{it} is the regressor denoting the threshold variable in the equation; μ_{it} is a vector of conditioning factors; and ε_{it} is an error term. The observations are divided and estimated with two regimes, which are based on whether the threshold variable q_{it} is larger or smaller than the threshold value of γ (Hansen, 1999). The threshold value γ is estimated by minimizing the sum of the squared residuals obtained for all potential thresholds.

Table 3 tests the first part of Hypothesis 2—a linear effect of women's legislative presence on government spending priorities. Models 1, 3, and 5 show the baseline results. Models 2, 4, and 6 show the results, including covariates. Standard errors in the models are clustered on the country level. To avoid potential omitted variable bias, I estimate all the models, including the fixed effects for the country and year. Table 3 shows findings from the linear fixed-effects models. The models with covariates (Models 2 and 6) show that a one percent increase in women's legislative presence is associated with small increases in health and total spending (0.05 and 0.08 percentage points, respectively). However, there is no such effect on education spending.

Table 3: Linear Effects of Women's Legislative Presence on Health, Education, and Total Spending

	Health Spending		Education Spending		Total Spending	
	(1)	(2)	(3)	(4)	(5)	(6)
Pct. women	0.044**	0.050**	0.071$^+$	0.006	-0.056	0.077**
	(0.015)	(0.016)	(0.042)	(0.047)	(0.067)	(0.028)
Log of GDP		-0.094		1.031		-3.020**
		(0.222)		(0.779)		(0.914)
Log of oil rents		-0.239$^+$		-0.040		-0.956
		(0.129)		(0.293)		(0.943)
Log of trade openness		-0.215		-0.194		2.426**
		(0.431)		(0.703)		(0.814)
Log of FDI		-0.169$^+$		-0.102		0.292*
		(0.086)		(0.184)		(0.147)
Log of ODA		0.074		-0.315		0.347
		(0.095)		(0.284)		(0.278)
Female unemployment rate		-0.046		-0.055		-0.071
		(0.031)		(0.075)		(0.059)
Leftist ruling party		-0.095		0.186		-0.133
		(0.271)		(0.383)		(0.305)
Proportional		-0.053		2.383		-3.191
		(0.458)		(1.769)		(2.879)
Majoritarian		0.168		1.718		-2.627
		(0.545)		(2.106)		(2.421)
Democracy		-0.909		-2.131		1.059
		(0.623)		(1.415)		(0.769)
Autocracy		0.040		-0.564		-0.340
		(0.537)		(1.513)		(0.747)
Cumulative autocracy		0.049		0.011		0.128
		(0.057)		(0.137)		(0.136)
Time and country FE	✓	✓	✓	✓	✓	✓
F	8.86	2.34	2.95	1.06	.717	3.48
Prob > F	.0034	.0073	.088	.4	.4	.000094
Observations	2601	2601	2601	2601	2601	2601

Standard errors in parentheses
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Threshold Effects of Women's Legislative Presence on Health, Education, and Total Spending

	Health Spending		Education Spending		Total Spending	
	(1)	(2)	(3)	(4)	(5)	(6)
Pct. women $\leqslant$ Threshold	-0.002	0.006	-0.040	-0.114	-0.286^{+}	-0.124
	(0.028)	(0.028)	(0.075)	(0.076)	(0.169)	(0.109)
Pct. women > Threshold	0.035*	0.042*	0.050	-0.019	-0.081	0.043
	(0.015)	(0.016)	(0.044)	(0.050)	(0.074)	(0.032)
Log of GDP		-0.101		1.014		-3.073**
		(0.220)		(0.773)		(0.931)
Log of oil rents		-0.258^{+}		-0.088		-0.973
		(0.134)		(0.292)		(0.941)
Log of trade openness		-0.187		-0.132		2.521**
		(0.431)		(0.680)		(0.850)
Log of FDI		-0.156^{+}		-0.073		0.303*
		(0.086)		(0.179)		(0.151)
Log of ODA		0.076		-0.310		0.367
		(0.091)		(0.276)		(0.278)
Female unemployment rate		-0.046		-0.055		-0.061
		(0.032)		(0.074)		(0.055)
Leftist ruling party		-0.098		0.168		-0.105
		(0.270)		(0.390)		(0.313)
Proportional		-0.009		2.505		-3.224
		(0.462)		(1.752)		(2.854)
Majoritarian		0.128		1.624		-2.565
		(0.557)		(2.064)		(2.359)
Democracy		-0.907		-2.171		1.126
		(0.620)		(1.398)		(0.771)
Autocracy		0.006		-0.683		-0.062
		(0.541)		(1.491)		(0.786)
Cumulative autocracy		0.054		0.024		0.132
		(0.057)		(0.137)		(0.136)
Time and country FE	✓	✓	✓	✓	✓	✓
F	5.62	2.2	3.63	1.4	1.71	3.42
Prob > F	0	0	0	0	0	0
Observations	2601	2601	2601	2601	2601	2601

Note: Standard errors are clustered on the country level. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5: Threshold Estimators (for Models 1—6 in Table 4)

Model	Threshold	Lower	Upper
(1)	18.2	17.6	18.3
(2)	18.2	17.6	18.3
(3)	18.6	18	18.7
(4)	18.6	18	18.7
(5)	8.3	8.2	8.4
(6)	12.1	11.5	12.2

Note: The table presents a threshold estimator for each model in Table 2, with the 95% CI represented by a lower and upper bound.

Table 4 tests the second part of Hypothesis 2—a threshold effect of women's legislative presence on government spending. It provides evidence of a threshold effect on health spending, with the threshold values identified in Table 5. As expected in Hypothesis 2, increasing women's legislative presence does not significantly influence health spending until the percentage of women reaches a critical value of 18.2%. Specifically, Model 2 shows that when the percentage of elected women is higher than the threshold value, a one percent increase of women's legislative presence is significantly associated with a small increase in health spending, 0.04 percentage points. The baseline Model 1 presents similar findings. Notably, the significant effects in Tables 3 and 4 appear to be reasonably small. However, in consideration of the fact that the effect is only based on an increase of one percentage point in women's legislative presence, it might not be small if the increase of elected women is more than one percentage point. The results with bootstrapping show further support for the threshold effect of women's legislative presence on health spending (see Appendix Table S.6). The results are robust to adding bootstrapping with 1,000 replications, suggesting that a lack of accuracy in the estimates does not drive the results.

Taken together, the findings in Tables 3 and 4 only partially support Hypothesis 2. While the increase in elected women has linear and threshold effects on health spending, no related effects are shown for education spending. Moreover, the effects of women's legislative presence based on the linear and threshold models diverge for total spending. An increased women's legislative presence has a linear effect on total spending growth, whereas no similar

threshold effect exists for total spending. This finding suggests that only health spending is a threshold function of women's legislative presence. Further, the linear effect could derive from an overall increase in total government spending after an increased proportion of elected women.

Do Quotas Matter? Gender Quotas and Social Spending

However, is the effect solely driven by an increased presence of women? An alternative explanation could be that quotas have particularly motivated women's substantive representation on government spending, as quotas might generate a mandate effect for quota women to act on behalf of women (Franceschet & Piscopo, 2008). The final explanation I examine is the existence of such a quota effect. At first glance, quota implementation is a likely driving factor for health spending. There is clearly a break in health spending when I center it on the years of quota implementation. Appendix Figure S.1 presents this pattern. I employ a set of staggered difference-in-differences to estimate the quota effect because the quota is adopted and implemented by different countries in varied years. The model specification takes the following form:

$$Y_{it} = \beta_0 + \beta_1 \sum_{i=1}^{k} D_{ik} + \mu_{it} + \varepsilon_{it} \tag{4}$$

where Y_{it} is the dependent variable denoting health, education, and total spending for country i in year t; D_{ik} is a treatment indicator that equals 1 for the country i, adopting or implementing quota policy in $k \geq t$ periods; μ_{it} is a vector of conditioning factors; and ε_{it} is an error term.

I excluded preexisting quota implementation and adoption to strengthen the validity of the inferences. Table 6 presents the findings of this estimation. Models 1–6 test Hypothesis 3a—a quota effect on government spending priorities. The models show that quota implementation has a significantly positive effect on health spending. Specifically, quota

Table 6: Effects of Quotas on Health, Education, and Total Spending

	Health Spending		Education Spending		Total Spending	
	(1)	(2)	(3)	(4)	(5)	(6)
Quota adoption	0.564$^+$		-0.615		0.828	
	(0.296)		(1.154)		(1.234)	
Quota implementation		0.630*		1.053		-0.948
		(0.298)		(1.018)		(0.949)
Log of GDP	-0.232	-0.211	0.999	0.649	-3.230***	-2.846**
	(0.238)	(0.233)	(0.896)	(0.892)	(0.942)	(0.965)
Log of oil rents	-0.285$^+$	-0.288$^+$	0.041	0.036	-1.166	-1.161
	(0.160)	(0.158)	(0.401)	(0.391)	(1.249)	(1.239)
Log of trade openness	-0.085	-0.065	-0.540	-0.575	2.414**	2.457*
	(0.407)	(0.395)	(0.689)	(0.701)	(0.918)	(0.948)
Log of FDI	-0.154$^+$	-0.153$^+$	-0.065	-0.080	0.342$^+$	0.358$^+$
	(0.092)	(0.092)	(0.201)	(0.206)	(0.184)	(0.181)
Log of ODA	0.074	0.082	-0.388	-0.388	0.420	0.423
	(0.106)	(0.104)	(0.318)	(0.316)	(0.326)	(0.315)
Female unemployment rate	-0.057$^+$	-0.059$^+$	-0.066	-0.074	-0.084	-0.075
	(0.032)	(0.032)	(0.086)	(0.085)	(0.064)	(0.062)
Leftist ruling party	-0.088	-0.074	0.038	0.089	-0.595	-0.645
	(0.318)	(0.321)	(0.474)	(0.467)	(0.374)	(0.392)
Proportional	0.228	0.178	2.764	2.465	-2.539	-2.231
	(0.457)	(0.461)	(1.823)	(1.782)	(2.572)	(2.574)
Majoritarian	0.095	0.106	1.349	1.344	-2.904	-2.895
	(0.532)	(0.549)	(2.191)	(2.139)	(2.424)	(2.435)
Democracy	-0.904	-0.911	-1.675	-1.829	1.311	1.475$^+$
	(0.664)	(0.662)	(1.384)	(1.396)	(0.810)	(0.820)
Autocracy	-0.085	-0.080	-0.872	-0.484	-0.595	-1.012
	(0.538)	(0.533)	(1.539)	(1.470)	(0.920)	(0.789)
Cumulative autocracy	0.072	0.071	0.026	0.038	0.162	0.150
	(0.058)	(0.058)	(0.145)	(0.145)	(0.138)	(0.138)
Time and country FE	✓	✓	✓	✓	✓	✓
F	1.8	1.84	.987	1.08	2.84	2.54
Prob > F	.05	.045	.47	.38	.0014	.0041
Observations	2057	2057	2057	2057	2057	2057

Note: Standard errors are clustered on the country level. $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

implementation leads to an increase in health spending by 0.63 percentage points. The effect is relatively large, considering the average health spending in the sample is only 9.87 %. Moreover, the direction of the quota adoption effect on health spending is positive but insignificant. This result is somewhat surprising and in contrast to the study by Clayton and Zetterberg (2018). They find that quota adoption instead of implementation has a significantly positive effect on health spending. Although quota adoption could contribute to a changing political climate that increases social spending, this finding reveals that quota implementation, rather than adoption, increases health spending by allowing more women to enter the legislature. These findings lend support for Hypothesis 3a—that quotas influence health spending after they are implemented, not after they are first adopted. This finding implies that the quota effect on health spending works through an increased legislative presence of women following quota implementation instead of driven by a changing political climate after quota adoption. Notably, there is no quota effect on education or total government spending. In an additional test, I employed mediation analysis to probe whether quotas have policy outcome implications—whether they further impact life expectancy and infant mortality rates in the real world through increased health spending. Appendix Tables S.8–9 present the results of quota implementation on life expectancy and infant mortality rates mediated by health spending. The tables show that an increase in health spending mediates 1.4% of the total quota effect on increased life expectancy and 5% of it on decreased infant mortality.

While quota implementation is significantly associated with a large increase in health spending, it is not clear if such a result holds for different quota types. Using the dichotomic quota implementation does not consider quota types that may distinguish the significance and the effectiveness of quota impact on health spending. Figure 2 compares the effect of the different quota types on health spending. The graph shows that reserved-seat quotas have the strongest and only significantly positive effect on health spending across the three quota types. Specifically, implementation of reserved-seat quotas leads to an increase in health spending of 0.92 percentage points, which is a more sizable effect relative to the effect of

Figure 2: Effects of Quota Implementation on Health Spending (Based on Different Types of Quotas)
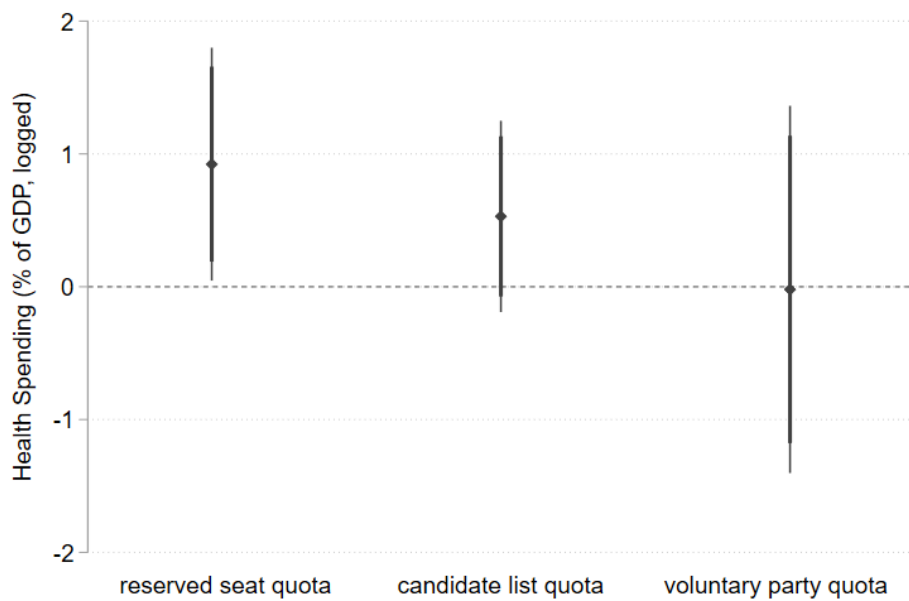
the dichotomic quota implementation. Overall, this finding broadly supports Hypothesis 3b: reserved-seat quotas have the strongest positive quota effect on health spending than any other quota type.

Conclusion

The increasing global diffusion of quotas and legislative presence of women are transforming the gender composition of national politics. Based on original panel data for 153 countries from 2000 to 2016, this study provides new insights about the origin of gender quotas and the implications of quotas and the increasing legislative presence of women on social spending. The analysis of quota implementation joins an increasing body of literature, pointing to the interaction between international and domestic factors to explain quota diffusion. A theoretical argument is formulated: Development assistance has an increasingly positive effect on quota implementation. While one may expect international development assistance to send strong signals for the countries receiving aids to adhere to the global gender norms,

the results show that this solely holds in countries with high levels of women's political rights. The findings reveal that development assistance has both cost and benefit for quota implementation. In general, development assistance becomes contributing to quota implementation as women's political rights increase. These findings provide empirical support for the theory, revealing that international development assistance has a sizable moderating effect on the relationship between women's political rights and quota implementation. Moreover, the effect is not induced by uneven patterns of assistance distribution.

Beyond testing the argument on domestic women's political rights as a moderator for the relationship between international development assistance and quota implementation, my subsequent analysis discerned the effects of increased legislative presence of women and gender quotas on government spending. First, I explore the effect of the legislative presence of women on government spending, based on the linear and threshold models. An increased legislative presence of women has a linear effect on the expansion of overall government size. Moreover, it has linear and threshold effects on the expansion of health spending. These findings raise important insights for policymakers. The findings suggest that increasing the proportion of women legislators leads to the expansion of overall government size, and such an effect exists in a linearly proportional way. This result indicates that increased health spending could derive from an overall increase in total government spending after increasing the proportion of elected women. Further, the threshold model empirically quantified the critical mass argument in gender and politics. The findings show that the relationship between the increased presence of women and health spending becomes significantly positive when the percentage of elected women reaches a critical threshold of approximately 18%.

Notably, it would be misleading to interpret the significant threshold effect as health spending merely being a threshold function of the proportion of seats held by women. For one, such an interpretation would neglect the political climate that could impact the process of budgeting. For another, in the words of Dahlerup (1988), "human beings do not act automatically like particles." For instance, it is unlikely that the Greek parliament, where 17.3% of the membership were women in 2011, would experience a significant increase in

health budget planning when women constituted 18.7% of the members one year later. This conclusion might imply that a critical mass is difficult to expect for a single country case over time. A perspective not explored in this paper is the possibility of a threshold effect on the microlevel over time. The panel data employed in this paper is not well suited for probing this effect. Future research could assess such a threshold effect through a single case study by combining, for instance, time-series analysis with in-depth qualitative evidence.

While one may initially anticipate that quota adoption signaling a change in national sentiment can lead to more allocation for the health budget, this study adds new evidence to the existing research by revealing that quota implementation, rather than adoption, leads to a significantly larger increase in health spending through more women being elected. Finally, in light of different quota types, the findings show that the reserved-seat quotas have the only significant and the strongest positive effect on increasing health spending across the three different quota types.

As countries worldwide increasingly embrace gender equality and implement policies that support women's rights, more women are entering public life. The time window (2000—2016) for the research design maximizes the observed variation in women's descriptive representation and gender quotas. Admittedly, external validity could be a concern if there was convergence in cross-sectional variation compared to an earlier period worldwide. Future research may prolong the time interval for more thorough scrutiny. Furthermore, this research assesses the social spending implications of quotas and women's increasing legislative presence. Whereas reserved seats are often designed to change the gender composition of the legislative bodies effectively, they are widely favored in authoritarian or semi-authoritarian regimes (Kang & Tripp, 2018). In these regimes, the dominant party could strategically employ quotas as a co-optation tool to maintain and gain support. It remains unclear how women can influence their policy priorities in these regimes. A venue for future research would be to assess this puzzling mechanism by exploring whether it might allow women to exert their policy preferences and spending priorities in authoritarian contexts.

References

Agerberg, M., & Kreft, A.-K. (2020). Gendered conflict, gendered outcomes: The politicization of sexual violence and quota adoption. *Journal of Conflict Resolution*, *64*(2-3), 290–317.

Avelino, G., Brown, D. S., & Hunter, W. (2005). The effects of capital mobility, trade openness, and democracy on social spending in latin america, 1980–1999. *American Journal of Political Science*, *49*(3), 625–641.

Badri, B., & Tripp, A. M. (2017). *Women's activism in Africa: Struggles for rights and representation*. London: Zed Books Ltd.

Baliamoune-Lutz, M. (2016). The effectiveness of foreign aid to women's equality organisations in the mena. *Journal of International Development*, *28*(3), 320–341.

Beath, A., Christia, F., & Enikolopov, R. (2013). Empowering women through development aid: Evidence from a field experiment in Afghanistan. *American Political Science Review*, *107*(3), 540–557.

Beckwith, K., & Cowell-Meyers, K. (2007). Sheer numbers: Critical representation thresholds and women's political representation. *Perspectives on Politics*, *5*(3), 553–565.

Boli, J., & Thomas, G. M. (1997). World culture in the world polity: A century of international non-governmental organization. *American Sociological Review*, 171–190.

Bratton, K. A., & Ray, L. P. (2002). Descriptive representation, policy outcomes, and municipal day-care coverage in Norway. *American Journal of Political Science*, *46*(2), 428–437.

Bräutigam, D. A. (1992). Governance, economy, and foreign aid. *Studies in Comparative International Development*, *27*(3), 3–25.

Bräutigam, D. A., & Knack, S. (2004). Foreign aid, institutions, and governance in sub-saharan africa. *Economic Development and Cultural Change*, *52*(2), 255–285.

Bush, S. S. (2011). International politics and the spread of quotas for women in legislatures. *International Organization*, *65*(1), 103–137.

Carroll, S. J. (2001). *The impact of women in public office*. Bloomington: Indiana University

Press.

Cingranelli, D., Filippov, M., & Mark, S. (2018). *Cirights dataset.* The Binghamton University Human Right Institute.

Clayton, A., & Zetterberg, P. (2018). Quota shocks: Electoral gender quotas and government spending priorities worldwide. *The Journal of Politics*, *80*(3), 916–932.

Clots-Figueras, I. (2012). Are female leaders good for education? Evidence from India. *American Economic Journal: Applied Economics*, *4*(1), 212–44.

Coppedge, M., Gerring, J., Knutsen, C. H., Lindberg, S. I., Teorell, J., Altman, D., . . . others (2019). *V-dem dataset v9.* Varieties of Democracy (V-Dem) Project.

Cowley, P., & Childs, S. (2003). Too spineless to rebel? New Labour's women MPs. *British Journal of Political Science*, *33*(3), 345–365.

Crowley, J. E. (2004). When tokens matter. *Legislative Studies Quarterly*, *29*(1), 109–136.

Cruz, C., Keefer, P., & Scartascini, C. (2018). *Database of political institutions 2017.* Washington, DC: Inter-American Development Bank.

Dahlerup, D. (1988). From a small to a large minority: Women in Scandinavian politics. *Scandinavian Political Studies*, *11*(4), 275–298.

Dahlerup, D. (2006). *Women, quotas and politics.* New York: Routledge.

Dahlerup, D. (2007). Electoral gender quotas: Between equality of opportunity and equality of result. *Representation*, *43*(2), 73–92.

Donno, D., & Kreft, A.-K. (2019). Authoritarian institutions and women's rights. *Comparative Political Studies*, *52*(5), 720–753.

Edgell, A. B. (2017). Foreign aid, democracy, and gender quota laws. *Democratization*, *24*(6), 1103–1141.

Finkel, S. E., Pérez-Liñán, A., & Seligson, M. A. (2007). The effects of US foreign assistance on democracy building, 1990–2003. *World Politics*, *59*(3), 404–439.

Finnemore, M., & Sikkink, K. (1998). International norm dynamics and political change. *International Organization*, *52*(4), 887–917.

Franceschet, S., & Piscopo, J. M. (2008). Gender quotas and women's substantive repre-

sentation: Lessons from Argentina. *Politics & Gender*, *4*(3), 393–425.

Friedman, M. (1995). *Foreign economic aid: Means and objectives*. Chicago: Hoover Press.

Geys, B., & Sørensen, R. J. (2019). The impact of women above the political glass ceiling: Evidence from a Norwegian executive gender quota reform. *Electoral Studies*, *60*, 102050.

Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics*, *93*(2), 345–368.

Hughes, M. M., Krook, M. L., & Paxton, P. (2015). Transnational women's activism and the global diffusion of gender quotas. *International Studies Quarterly*, *59*(2), 357–372.

Hughes, M. M., Paxton, P., Clayton, A., & Zetterberg, P. (2017). Quota adoption and reform over time (qarot), 1947-2015.

Hughes, M. M., Paxton, P., Clayton, A. B., & Zetterberg, P. (2019). Global gender quota adoption, implementation, and reform. *Comparative Politics*, *51*(2), 219–238.

Inglehart, R., & Norris, P. (2003). *Rising tide: Gender equality and cultural change around the world*. Cambridge: Cambridge University Press.

Inglehart, R., & Welzel, C. (2010). Changing mass priorities: The link between modernization and democracy. *Perspectives on Politics*, *8*(2), 551–567.

International IDEA. (2019). *Global database of gender quota (International IDEA and Inter-Parliamentary Union and Stockholm University)*. `https://www.idea.int/data-tools/data/gender-quotas/database`. ((accessed September 16, 2019))

IPU. (2015). *Women in parliament: 20 years in review (Inter-Parliamentary Union)*. `http://archive.ipu.org/pdf/publications/WIP20Y-en.pdf`. ((accessed May 10, 2020))

Kang, A. J., & Tripp, A. M. (2018). Coalitions matter: Citizenship, women, and quota adoption in Africa. *Perspectives on Politics*, *16*(1), 73–91.

Kanter, R. M. (1977). *Men and women of the corporation*. New York: Basic books.

Keck, M. E., & Sikkink, K. (1998). *Activists beyond borders*. New York: Cornell University Press.

Kittilson, M. C. (2008). Representing women: The adoption of family leave in comparative perspective. *The Journal of Politics*, *70*(2), 323–334.

Knack, S. (2004). Does foreign aid promote democracy? *International Studies Quarterly*, *48*(1), 251–266.

Krook, M. L. (2006). Reforming representation: The diffusion of candidate gender quotas worldwide. *Politics & Gender*, *2*(3), 303–327.

Krook, M. L. (2014). Electoral gender quotas: A conceptual analysis. *Comparative Political Studies*, *47*(9), 1268–1293.

Lovenduski, J. (2001). Women and politics: Minority representation or critical mass? *Parliamentary Affairs*, *54*(4), 743–758.

Matland, R. E., & Studlar, D. T. (1996). The contagion of women candidates in single-member district and proportional representation electoral systems: Canada and Norway. *The Journal of Politics*, *58*(3), 707–733.

Meyer, J. W., Boli, J., Thomas, G. M., & Ramirez, F. O. (1997). World society and the nation-state. *American Journal of Sociology*, *103*(1), 144–181.

Michelle Heath, R., Schwindt-Bayer, L. A., & Taylor-Robinson, M. M. (2005). Women on the sidelines: Women's representation on committees in Latin American legislatures. *American Journal of Political Science*, *49*(2), 420–436.

O'Brien, D. Z., & Rickne, J. (2016). Gender quotas and women's political leadership. *American Political Science Review*, *110*(1), 112–126.

Paxton, P., & Hughes, M. M. (2015). The increasing effectiveness of national gender quotas, 1990–2010. *Legislative Studies Quarterly*, *40*(3), 331–362.

Paxton, P., Hughes, M. M., & Painter, M. A. (2010). Growth in women's political representation: A longitudinal exploration of democracy, electoral system and gender quotas. *European Journal of Political Research*, *49*(1), 25–52.

Ramirez, F. O., Soysal, Y., & Shanahan, S. (1997). The changing logic of political citizenship: Cross-national acquisition of women's suffrage rights, 1890 to 1990. *American Sociological Review*, 735–745.

Rosen, J. (2017). Gender quotas for women in national politics: A comparative analysis across development thresholds. *Social Science Research*, *66*, 82–101.

Saint-Germain, M. A. (1989). Does their difference make a difference? The impact of women on public policy in Arizona legislature. *Social Science Quarterly*, *70*(12), 956–68.

Schwindt-Bayer, L. A. (2006). Still supermadres? Gender and the policy priorities of Latin American legislators. *American Journal of Political Science*, *50*(3), 570–585.

Schwindt-Bayer, L. A. (2009). Making quotas work: The effect of gender quota laws on the election of women. *Legislative Studies Quarterly*, *34*(1), 5–28.

Stasavage, D. (2005). Democracy and education spending in africa. *American Journal of Political Science*, *49*(2), 343–358.

Studlar, D. T., & McAllister, I. (2002). Does a critical mass exist? A comparative analysis of women's legislative representation since 1950. *European Journal of Political Research*, *41*(2), 233–253.

Thomas, S. (1991). The impact of women on state legislative policies. *The Journal of Politics*, *53*(4), 958–976.

Thomas, S. (1994). *How women legislate.* Oxford: Oxford University Press.

Thomas, S., & Welch, S. (1991). The impact of gender on activities and priorities of state legislators. *Western Political Quarterly*, *44*(2), 445–456.

Tilly, C. (1992). *Coercion, capital, and european states, ad 990-1992.* Oxford: Blackwell Oxford.

Tripp, A. M. (2012). *Women and politics in uganda.* University of Wisconsin Press.

Tripp, A. M., & Kang, A. (2008). The global impact of quotas: On the fast track to increased female legislative representation. *Comparative Political Studies*, *41*(3), 338–361.

Wright, J. (2009). How foreign aid can foster democratization in authoritarian regimes. *American Journal of Political Science*, *53*(3), 552–571.

Yoder, J. D. (1991). Rethinking tokenism: Looking beyond numbers. *Gender & Society*, *5*(2), 178–192.

Global Diffusion of Gender Quotas, Women's Legislative Presence, and Social Spending

Supplementary Appendix

1 Variables Definition

Table S.1: Variable Definitions and Sources

Variable	Variable Definition	Source
Dependent Variables:		
implement	a binary variable indicating whether a country has implemented a quota	Quota Adoption and Reform Over Time (QAROT), Global Database of Gender Quota
percentHeaExp	domestic general government health expenditure (% of general government expenditure)	World Development Indicators (WDI)
percentEduExp	education expenditure (% of general government expenditure)	World Development Indicators (WDI)
percentSpendingGDP	total government spending (% of GDP)	World Development Indicators (WDI)
Independent Variables:		
z2lagDAofGDP	standardized lagged net official development assistance received as % GDP	World Development Indicators (WDI)
wopol	women's political rights	CIRIGHTS Database
implement	a binary variable indicating whether a country has implemented a quota	Quota Adoption and Reform Over Time (QAROT), Global Database of Gender Quota
adopt	binary variable indicating whether a country has adopted a quota	Quota Adoption and Reform Over Time (QAROT), Global Database of Gender Quota
quota_seat_imp	binary variable indicating whether a country has implemented reserved seat quota	Global Database of Gender Quota
quota_list_imp	binary variable indicating whether a country has implemented candidate list quota	Global Database of Gender Quota
quota_party_imp	binary variable indicating whether a country has implemented voluntary party quota	Global Database of Gender Quota

Table S.2: Variable Definitions and Sources

Variable	Variable Definition	Source
Control Variables:		
$loglagGDPPC$	log (lagged GDP per capita, current US $)	World Development Indicators (WDI)
$loglagTradeofGDP$	log (lagged trade as % GDP)	World Development Indicators (WDI)
$loglagFDIofGDP$	log (lagged foreign direct investment, net inflows as % GDP)	World Development Indicators (WDI)
$loglagOilrentsofGDP$	log (lagged oil rents as % GDP)	World Development Indicators (WDI)
$loglagODAofGDP$	log (lagged net official development assistance received as % GDP)	World Development Indicators (WDI)
$femunem$	Unemployment, female (% of female labor force) (ILO estimate)	World Development Indicators (WDI)

Table S.3: Variable Definitions and Sources

Variable	Variable Definition	Source
Control Variables:		
democbi	binary variable indicating whether a country has a polity score of 6 or higher	Polity IV data
autocbi	binary variable indicating whether a country has a polity score of -6 or lower	Polity IV data
autocbiyears	the total number of years a country has experienced autocracy from 1945 to the last year of observations	Polity IV data
maj	binary variable indicating whether an electoral rule is majoritarian	Database Of Political Institutions
pr	binary variable indicating whether an electoral rule is proportional	Database Of Political Institutions
leftist	binary variable indicating whether ruling party is leftist	Database Of Political Institutions
advancedind	binary variable indicating whether a country is an advanced industrial democracy	USAID Data, World Bank, Freedom House, and Database of Political Institutions
corrindex	political corruption index	Varieties of Democracy (V-Dem)
unpeace	binary variable indicating whether there is the presence of UN peacekeeping	UN data, retrieved from: `https://peacekeeping.un.org/sites/default/files/unpeacekeeping-operationlist_3_1_0.pdf`

2 Descriptive Statistics

Table S.4: Summary Statistics (2000-2016)

	μ	σ	Min	Max	N
Dependent Variables:					
implement	0.33	0.47	0	1	2601
percentHeaExp	9.87	5.05	0	42.05	2601
percentEduExp	25.95	9.91	1.51	89.27	2601
percentSpendingGDP	17.14	7.80	1.05	148.07	2601
Independent Variables:					
z2lagODAofGDP	0	1	-0.57	11.33	2601
wopol	2.04	0.57	0	3	2601
implement	0.33	0.47	0	1	2601
adopt	0.41	0.49	0	1	2601
quota_seat_imp	0.07	0.25	0	1	2601
quota_list_imp	0.17	0.38	0	1	2601
quota_party_imp	0.09	0.29	0	1	2601
Control Variables:					
loglagGDPPC	8.16	1.61	4.63	11.69	2601
loglagTradeofGDP	4.29	0.62	-1.79	6.08	2601
loglagFDIofGDP	0.91	1.31	-13.55	5.29	2601
loglagOilrentsofGDP	-0.14	2.26	-9.34	4.53	2601
loglagODAofGDP	0.31	1.73	-9.60	4.40	2601
femunem	8.85	7.10	0.20	43.87	2601
democbi	0.58	0.49	0	1	2601
autocbi	0.13	0.34	0	1	2601
autocbiyears	17.56	17.68	0	72	2601
maj	0.45	0.50	0	1	2601
pr	0.47	0.50	0	1	2601
left	0.29	0.46	0	1	2601
advancedind	0.16	0.36	0	1	2601
unpeace	0.07	0.25	0	1	2601
duration	27.15	31.79	0	207	2601
corrindex	0.53	0.30	0.01	0.98	2601

3 Health Expenditure as Percentage of GDP (Centered Around Quota Implementation)

Figure S.1: Health Expenditure as Percentage of GDP (Centered Around Quota Implementation)
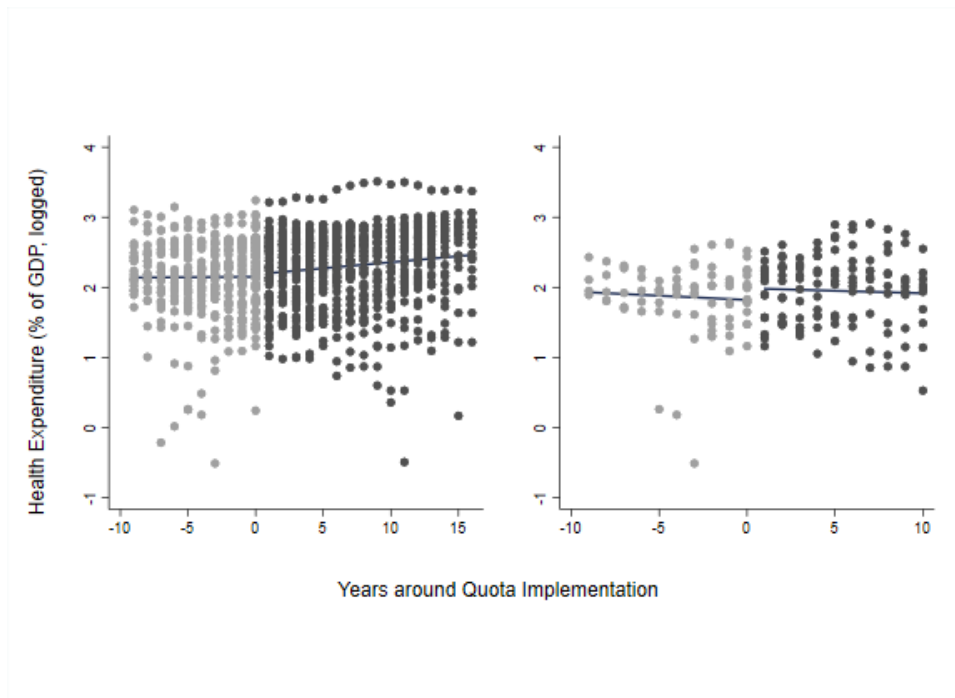
Note: The scattered plots show health expenditure as percentage of GDP centered around quota implementation for all quota types (left) and reserved seats quota (right).

4 Gender Quotas Implementation and Women's Legislative Presence Worldwide

Figure S.2: Implementation of gender quotas around the world
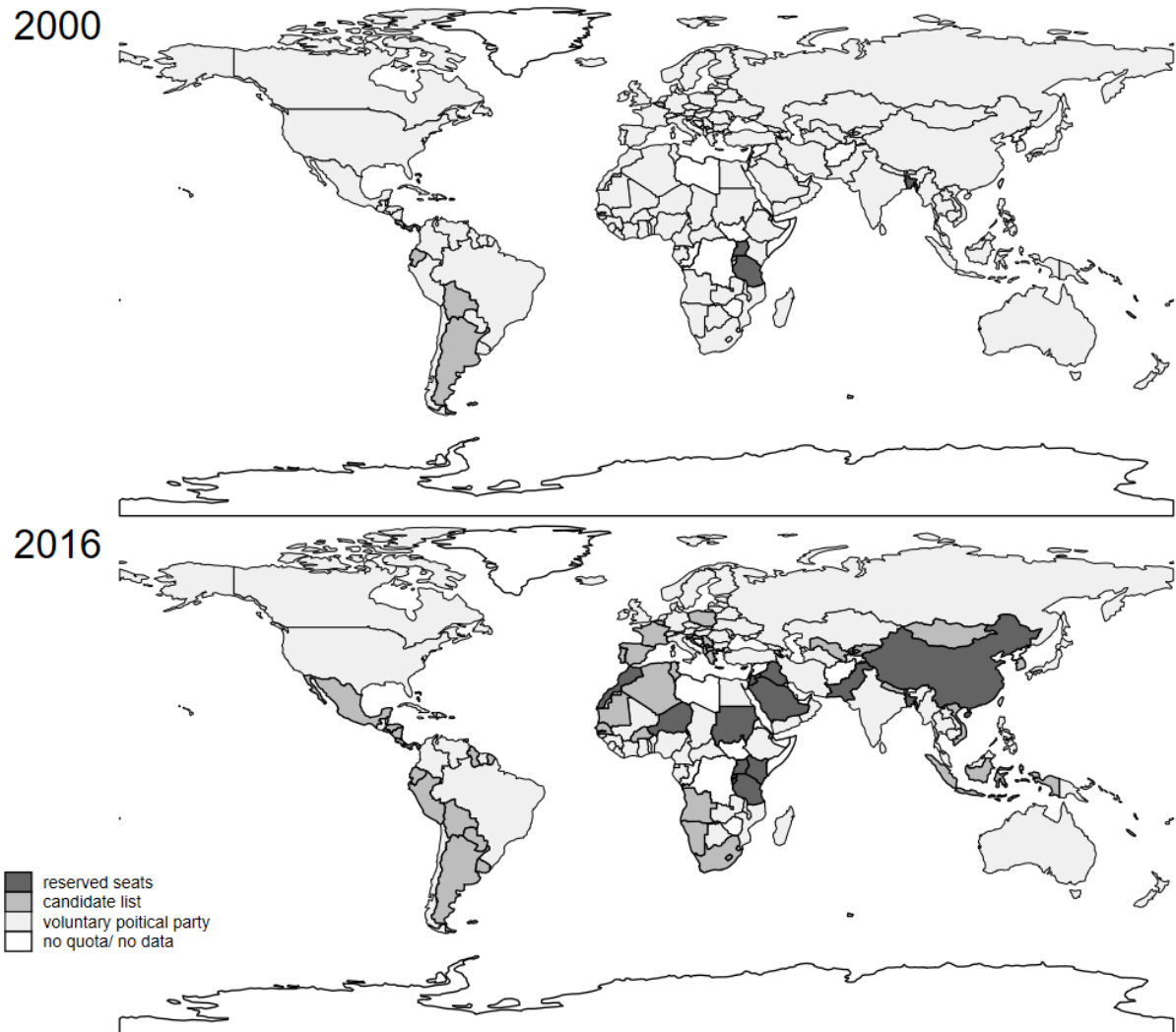
Note: The world maps demonstrate the implementation of different types of gender quotas around the world. The country variations for the years 2000 and 2016 are displayed. Darker to lighter areas indicate the implementation of reserved seats quotas, candidate list quotas, and voluntary party quotas. The data is sourced from the gender quotas database by International IDEA (2019) and the QAROT data (quota adoption and reform over time) by Hughes, Paxton, Clayton, and Zetterberg (2017).

Figure S.3: Proportion of seats held by women around the world
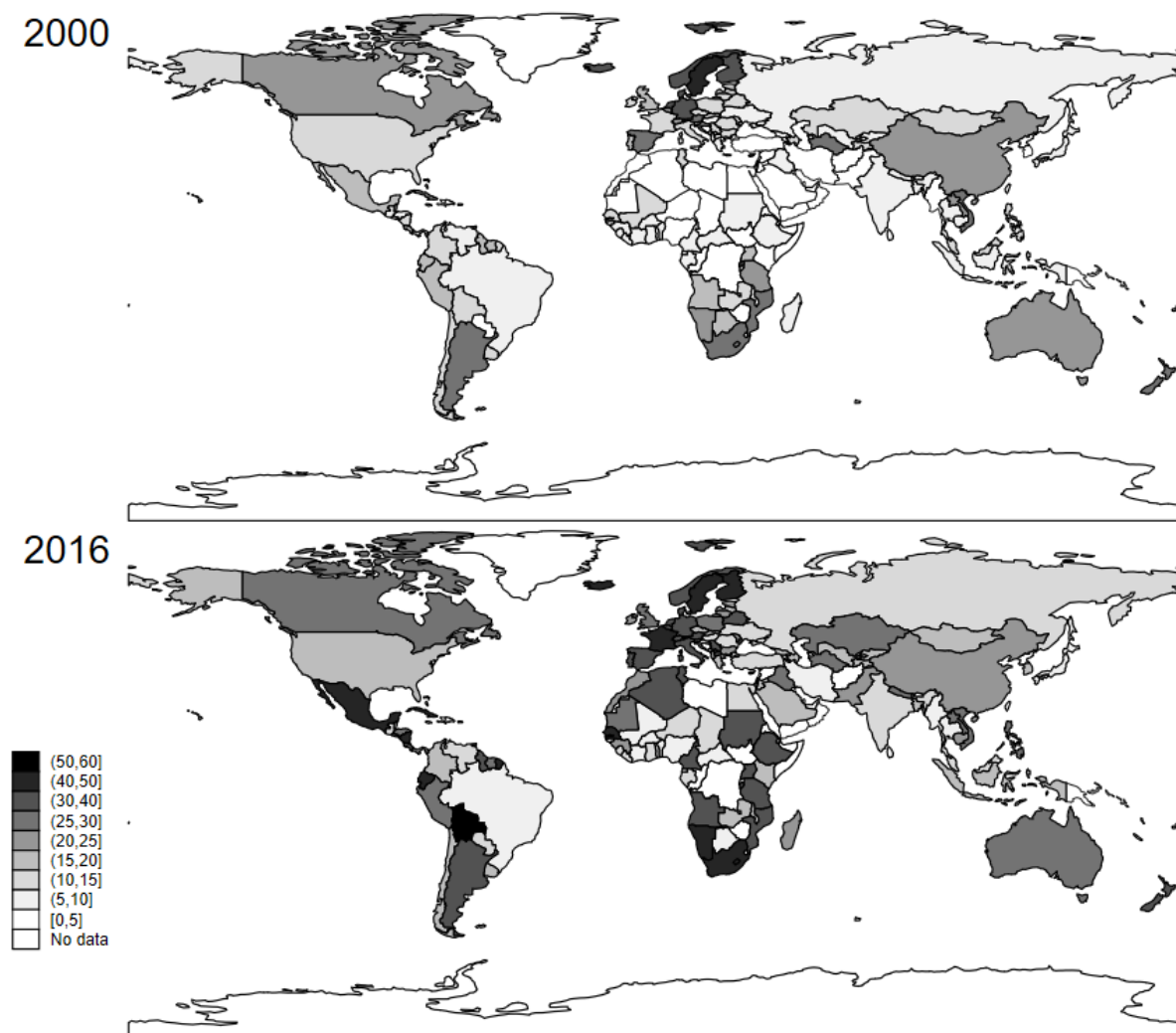
Note: The world maps demonstrate the proportion of parliamentary seats occupied by women in a single or lower house. The country variations for the years 2000 and 2016 are displayed. Darker areas indicate a higher level of women's parliamentary presence. The data is sourced from the Inter-Parliamentary Union (IPU).

Figure S.4: Average number of implemented legal quotas and the average percentage of legislative seats held by women worldwide, 2000—2016
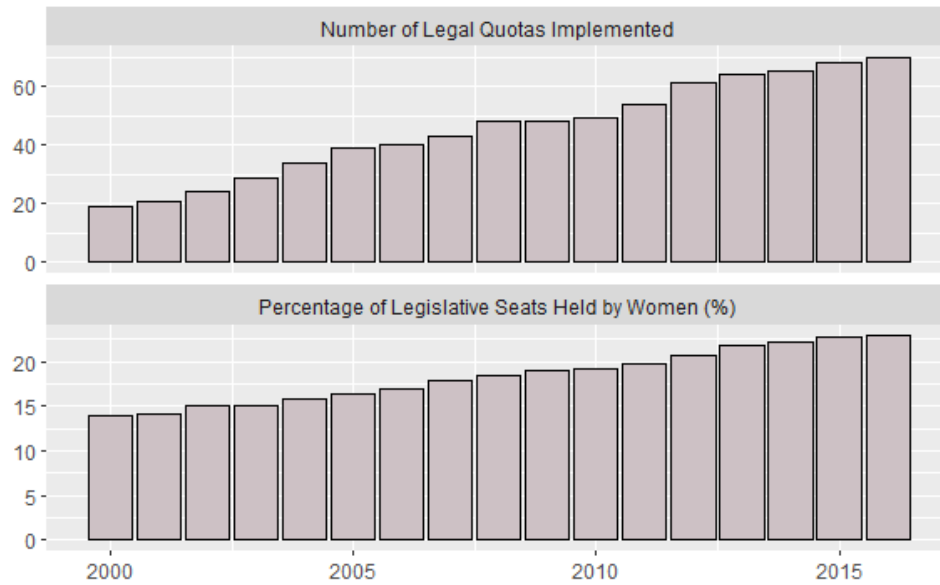
Note: The barplots indicate the number of legal quotas (reserved seats and candidate list) implemented and the average percentage of legislative seats held by women around the world from 2000 to 2016. The data is sourced from the QAROT data (quota adoption and reform over time) by Hughes et al. (2017).

5 Robustness and Additional Tests on Quota Implementation: Inclusion of Only Less Developed Countries

Table S.5: Logistic Regressions of Quota Implementation

	(1) Simple	(2) Interaction
Women's political rights	2.115***	2.741***
	(0.333)	(0.389)
ODA	-0.980***	-6.678***
	(0.246)	(1.219)
Women's political rights × ODA		2.624***
		(0.541)
Female unemployment rate	-0.137***	-0.154***
	(0.036)	(0.037)
Leftist ruling party	-0.480	-0.462
	(0.355)	(0.364)
Proportional	3.415***	3.750***
	(0.873)	(1.047)
Majoritarian	0.631	0.597
	(0.661)	(0.744)
Democracy	2.975**	0.726
	(1.071)	(0.812)
Autocracy	-2.514**	-3.492**
	(0.920)	(1.082)
Political corruption	-12.964***	-18.194***
	(2.416)	(2.787)
UN Peacekeeping	-2.444**	-4.700***
	(0.855)	(1.271)
Time and Country FE	✓	✓
AIC	481	451
BIC	528	502
Prob $> \chi^2$	0	0
Observations	782	782

Standard errors in parentheses

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

Figure S.5: Marginal Effects of ODA on Quota Implementation
(Based on Model 2 in Table S.5)
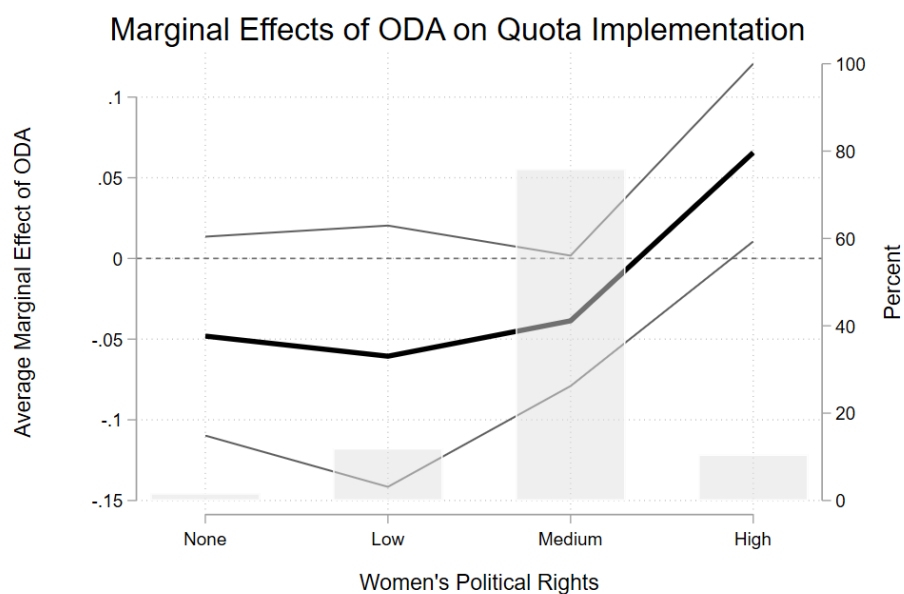
Marginal Effects of ODA on Quota Implementation

Note: The figure shows the marginal effects of the received official development assistance (percentage of GDP) on quota implementation including only less developed countries. Histogram indicates the observation shares. The marginal effects are shown with 95 percent CI and are based on model 2 in Table S.5.

6 Testing Robustness of Threshold Models Using Bootstrapping

Table S.7: Threshold Estimators (for Models 1-4 in Table S6)

Model	Threshold	Lower	Upper
(1)	16	15.3	16.2
(2)	15.4	14.6	15.5
(3)	9.5	8.6	9.6
(4)	9.5	8.6	9.6
(5)	7.7	7.6	7.8
(6)	13.2	12.4	13.3

Note: Table presents threshold estimator for each model in table 2, with the 95 percent confidence interval represented by a lower and upper bound.

Table S.6: Threshold Effects of Women's Legislative Presence on Health, Education and Total Spending

	Health Spending		Education Spending		Total Spending	
	(1)	(2)	(3)	(4)	(5)	(6)
Pct. women ⩽ Threshold	-0.015	0.004	0.249	0.179	-0.425[+]	-0.169
	(0.030)	(0.031)	(0.166)	(0.154)	(0.216)	(0.130)
Pct. women > Threshold	0.025	0.043*	0.088	0.014	-0.117	0.024
	(0.016)	(0.018)	(0.054)	(0.058)	(0.093)	(0.041)
Log of GDP		-0.344		0.977		-3.536**
		(0.236)		(0.923)		(1.125)
Log of oil rents		-0.307[+]		0.037		-1.195
		(0.157)		(0.392)		(1.228)
Log of trade openness		-0.052		-0.619		2.607**
		(0.406)		(0.717)		(0.971)
Log of FDI		-0.138		-0.049		0.361*
		(0.091)		(0.194)		(0.175)
Log of ODA		0.085		-0.402		0.455
		(0.103)		(0.318)		(0.332)
Female unemployment rate		-0.050		-0.060		-0.076
		(0.032)		(0.085)		(0.063)
Leftist ruling party		-0.098		0.083		-0.532
		(0.319)		(0.484)		(0.386)
Proportional		0.171		2.593		-2.724
		(0.455)		(1.738)		(2.631)
Majoritarian		0.224		1.130		-2.661
		(0.565)		(2.190)		(2.322)
Democracy		-0.897		-1.726		1.585[+]
		(0.659)		(1.370)		(0.841)
Autocracy		0.064		-0.822		-0.223
		(0.519)		(1.516)		(0.826)
Cumulative autocracy		0.070		0.015		0.177
		(0.058)		(0.146)		(0.148)
Time and country FE	✓	✓	✓	✓	✓	✓
F	4.91	1.81	1.53	.936	2.3	2.82
Prob > F	0	0	0	1	0	0
Observations	2057	2057	2057	2057	2057	2057

Note: Standard errors are clustered on the country level using Huber/White/sandwich estimator. [+] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

7 Additional Test: Mediation Analysis

Table S.8: Effects of Quota Implementation on Life Expectancy
(Mediated by Health Expenditure)

Effect	Mean	[95% Confidence Interval]	
ACME (Average Causal Mediation Effect)	0.034	0.001	0.074
Direct Effect	2.419	2.061	2.769
Total Effect	2.453	2.102	2.804
% of Total Effect mediated	1.4	0.012	0.016

Note: The table shows results of causal mediation analysis. ACME indicates of the estimated 2.45 (Total Effect) increase in the years of life expectancy, an estimated 0.03 (ACME) is as a result of the health expenditure changes generated by quota implementation and the remaining 2.42 (Direct Effect) is from quota implementation itself.

Table S.9: Effects of Quota Implementation on Infant Mortality Rate
(Mediated by Health Expenditure)

Effect	Mean	[95% Confidence Interval]	
ACME (Average Causal Mediation Effect)	-0.253	-0.407	-0.123
Direct Effect	-4.767	-5.765	-3.730
Total Effect	-5.020	-6.020	-4.037
% of Total Effect mediated	5	0.042	0.063

Note: The table shows results of causal mediation analysis. ACME indicates of the estimated 5.02 (Total Effect) decrease in the infant mortality rate, an estimated -0.25 (ACME) is as a result of the health expenditure changes generated by quota implementation and the remaining -4.77 (Direct Effect) is from quota implementation itself.

8 Countries in the Sample

This section provides a list of all the countries in the sample. The countries listed in bold are the countries implemented gender quota. The list also shows quota implementation and adoption year for the countries that have implemented or adopted gender quota during the time period (2000—2016).

Country	Quota Implementation (Adoption) Year	
Albania	2009	(2008)
Algeria	2012	
Angola	2008	
Argentina		
Armenia	2007	(1999)
Australia		
Austria		
Azerbaijan		
Bahrain		
Bangladesh	2005	(2004)
Belarus		
Belgium		
Benin		
Bhutan		
Bolivia		
Botswana		
Brazil		(1995)
Bulgaria		
Burkina Faso	2012	(2009)
Burundi	2005	
Cambodia		
Cameroon		(1996)
Canada		
Central African Republic		
Chad		
Chile		(2015)
China	2008	(2007)
Colombia		(2011)
Comoros		
Congo, Dem. Rep.		(2011)
Congo, Rep.		(2007)
Costa Rica		
Cote d'Ivoire / Ivory Coast		(2001)
Croatia		
Cuba		
Cyprus		
Czech Republic		(before 2000)
Denmark		
Dominican Republic		
Ecuador		

Egypt, Arab Rep.	2010-2013	(2009-2013)
El Salvador	2016	(2013)
Equatorial Guinea		
Estonia		
Eswatini		(2005)
Ethiopia	2005	
Fiji		
Finland		
France	2002	(1999)
Gabon		
Gambia		
Georgia		
Germany		
Ghana		
Greece	2012	
Guatemala	2007	
Guinea		(2009)
Guinea-Bissau		
Guyana	2002	(2000)
Haiti		(2012)
Honduras	2005	(2000)
Hungary		
Iceland		
India		
Indonesia	2004	(2003)
Iran, Islamic Rep.		
Iraq	2005	(2004)
Ireland		(2012)
Israel		
Italy	2008	
Jamaica		
Japan		
Jordan	2003	
Kazakhstan		
Kenya	2013	(2010)
Korea Republic	2004	(1995)
Kuwait		
Kyrgyz Republic	2007	
Lao PDR		
Latvia		
Lebanon		
Lesotho	2012	(2011)
Liberia		(2005)

Lithuania		
Luxembourg		(2016)
Madagascar		
Malawi		
Malaysia		
Mali		(2016)
Mauritania	2006	
Mauritius		
Mexico	2003	(2002)
Moldova		(2016)
Mongolia	2012	(2011)
Morocco	2002	
Mozambique		
Myanmar		
Namibia	2013	
Nepal	2008	(2007)
Netherlands		
New Zealand		
Nicaragua	2002	(2000)
Niger	2004	(2002)
Nigeria		
North Macedonia	2002	
Norway		
Oman		
Pakistan	2002	
Panama		
Papua New Guinea		
Paraguay	2003	(1996)
Peru	2001	(1997)
Philippines		
Poland	2011	
Portugal	2009	(2006)
Qatar		
Romania	2004	(2001)
Russia		
Rwanda	2003	
Saudi Arabia	2013	(2011)
Senegal	2012	(2010)
Serbia	2007	(2004)
Sierra Leone		
Singapore		
Slovak Republic		
Slovenia	2009	(2006)

Solomon Islands		
South Africa	2009	
Spain	2008	(2007)
Sri Lanka		
Sudan	2010	(2008)
Suriname		
Sweden		
Switzerland		
Tajikistan		
Tanzania		
Thailand		
Timor-Leste	2007	(2006)
Togo		(2013)
Trinidad and Tobago		
Tunisia	2014	
Turkey		
Turkmenistan		
Uganda		
Ukraine		
United Kingdom		
United States of America		
Uruguay	2014	(2009)
Uzbekistan	2004	
Venezuela		(2015)
Vietnam	2016	(2015)
Yemen		
Zambia		

References

Hughes, M. M., Paxton, P., Clayton, A., & Zetterberg, P. (2017). Quota adoption and reform over time (qarot), 1947-2015.

International IDEA. (2019). *Global database of gender quota (International IDEA and Inter-Parliamentary Union and Stockholm University).* `https://www.idea.int/data-tools/data/gender-quotas/database`. ((accessed September 16, 2019))

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