ELECTORAL SYSTEMS AND THE GENDER-BASED ECONOMIC PARTICIPATION AND OPPORTUNITY GAP

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ABSTRACT

This thesis examines the relationship between electoral systems and gender-based inequality. Using the World Bank's Economic Participation and Opportunity Subindex – a composite measure of wage equality, the labor force participation female-male ratio, the earned income female-male ratio, the female-male ratio of particular positions of power, and the female-male ratio of professional and technical workers – to represent this inequality, and using election policy information from the International Institute for Democracy and Electoral Assistance (IDEA), I test whether plurality/majority systems are worse for economic gender parity than are proportional representation systems. With rigorous OLS regression analysis, I find unexpectedly that Majority/Plurality electoral systems (such as First Past the Post) have a statistically significant positive relationship with the economic achievement gap, indicating greater equality under these election systems, whereas Proportional Representation systems (such as List PR) are negatively associated with the economic achievement gap. These findings, combined with related research and literature, indicate that the manner by which legislatures are elected has an impact on women's prospect for economic equality.

For Bronwyn, Rowan, Blythe, and Liam, whom I hope will one day know a world in which this thesis is no longer relevant.

Special thanks to Professors Andrew S. Wise, Peggy Sharpe, Gloria Lessan, Brad T. Gomez, and Gary J. Bass; to the scholars, activists, and women who have laid the groundwork for my research; to my parents, from whom I learned that there is no such thing as "too many books"; and to my partner and co-advocate, Shane A. McCammon.

Many thanks,
Rachel

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CHAPTER I: INTRODUCTION

The 2016 election of Donald J. Trump to the office of President of the United States has incited a wave of calls to reform the US electoral system. Trump, who lost the popular vote by a margin of 2.10 percent[1] to his opponent, Hillary Clinton, nevertheless won the race by garnering a greater number of Electoral College votes. Yet, strictly in terms of the apparent disparity between voters' selections and the ultimate outcome, such a phenomenon was not novel; Trump's success was the fifth presidential election in US history in which the end result was at odds with the popular vote.

The significance of this vote-outcome incongruity should not be understated. The United States, like many other democracies, relies on a single member district (SMD) plurality system for its national-level presidential and legislative elections. As a case study, it reinforces (and, by virtue of the nature of social science scholarship, contributes to) political science's Duverger's law, which holds that SMDs tend to favor two-party systems, whereas "the double ballot majority system and proportional representation [(PR)] tend to favor multipartisanism" (Riker, 1982). Primary among the known consequences of this design are two umbrellas of effects: (1) Government representatives, their agendas, and their platforms do not accurately represent voters' preferences; and (2) the very existence of smaller SMDs within a larger electorate creates opportunities for effective disenfranchisement by weighing some votes more or less heavily than others. In

[1] United States of America. Federal Election Commission. Public Records Branch, Public Disclosure and Media Relations Division, Office of Communication. January 30, 2017. Accessed September 29, 2018. https://transition.fec.gov/pubrec/fe2016/2016presgeresults.pdf.

some systems, districts are bounded by relatively stable characteristics, such as jurisdictional lines. In others, however, they can be drawn and redrawn on an ongoing basis by groups in power, on supposedly arbitrary bases, for the purposes (or, at least, with the result) of perpetuating a stratification of privileged versus marginalized segments of a population.

In light of these vulnerabilities, in this paper I explore whether the format of elections is correlated with deleterious economic indicators associated with one particular demographic: women. **Specifically, I ask whether countries with plurality/majority electoral systems (such as SMDs) are more or less likely to exhibit gender-based economic disparity than are states with systems of proportional representation.** Given women's disadvantaged role in many societies throughout history and their underrepresentation as heads of state and in legislative bodies, combined with a corresponding presumption of their lesser participation in deciding how electoral district lines are drawn, I hypothesize that the economic participation and opportunity gap is larger where plurality/majority systems are used.

Using data collected by the World Bank, to test my hypothesis I construct a model that controls for other demographic variables that may affect economic participation and opportunity differently along gender lines, such as the labor force participation rate, the teen birth rate, and varied aspects of GDP.

My goal in pursuing this question is to uncover a greater understanding of the socioeconomic implications of comparative electoral schemes so that they may be considered in the evaluation and proposition of election policies.

In my next chapter, I provide an overview of the literature on and background of the distinctive electoral systems and the modeled differences among them as identified by the field of political science, as well as of global trends in women's inequality and the factors associated with a male-female wage gap. In Chapter 3, I describe the conceptual model I use to test my hypothesis, explaining the logic behind the inclusion of each variable, and in Chapter 4, I describe the data and methods applied to that model. In Chapters 5 and 6, I review the empirical model, evaluating the results of my test, analyzing the statistical significance of my findings, and thoroughly describing my methodology and the limitations on my process. Finally, in Chapter 7, I conclude with a discussion of the policy implications of my findings and provide recommendations for future research.

CHAPTER II: BACKGROUND AND LITERATURE REVIEW

Despite the fact that the topic of inquiry here has potentially huge implications for roughly half of the population in democratic countries, there is a dearth of literature focusing on the intersections of wage disparity and electoral policies. What does exist, however, are three primary categories of review that are nevertheless relevant to the topic and which inform on the various moving parts therein contained: (1) the body of research devoted specifically to elections, electoral systems, and election rules; (2) research on other indicators that have been shown to be affected by electoral systems; and (3) scholarship on gender gaps.

Political Science and the Study of Elections

The first of these categories has come to be its own academic field, political science, which teases out the various schemes by which officials are selected. This is exhibited by the discipline's "rules" that predict how certain policies will result with respect to the distribution of power and to negotiated outcomes. The chart below organizes some of these systems into categories based on common foundational principles:

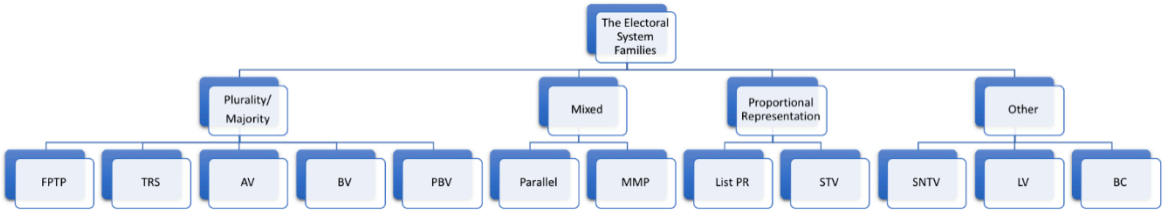

Figure 1: The Electoral System Families, as Arranged by IDEA

Most salient to our topic is the aforementioned Duverger's law, which holds that SMDs favor two-party systems, whereas PR favors multipartisanism. But the body of political science work also offers insights regarding the larger space for coalition work in PR systems compared to SMD systems (important for women's needs being represented by a legislature); voter behavior and motives, touched upon below; the significance of socioeconomic factors in terms of influencing election results, as outlined by [Zimmerman (1994)]; and the effectiveness of methods used to manipulate districting via gerrymandering in SMD systems (Engstrom, 2013; Kernell and Smith, 2010; Dalton Farrell, and McAllister, 2011).

Indicators Shown to Be Affected by Electoral Systems

The next category of related literature covers the known impact of electoral rules on equality and quality-of-life indicators. [Johnson-Myers (2017)] provides a useful synthesis of theory and research in her descriptively named chapter, "The Impact of Electoral Systems on Women's Political Representation." In it, she emphasizes the role of electoral systems on helping to determine who gains power. In PR systems, for example, women hold a larger proportion of legislative seats than do their counterparts in SMD systems (Norris, 2004). PR systems also result in more so-called "quality factors" of both minority representation – [Selway (2015)], for example, illustrates empirically that electoral systems can have a major impact on the health outcomes of marginalized communities within a country – and voter participation (Lijphart, 1994).

Both of these are tied to the greater "district magnitudes" afforded by PR (Klingemann, 2009; Gschwend, 2009). When voters can elect legislators according to

their closest preferences, rather than merely selecting one of two options that stand a chance, and without the interference of complex district lines, lawmaking is more reflective of women's and minorities' interests. Party rolls are also important here. In PR systems, parties generally have publicly available rolls with members rank-ordered according to the parties' parliamentary priorities. The number of seats a party wins from an election will determine how many members can be promoted to the legislature. Research has shown that voters – especially women and minority voters – are motivated when they can see parties' compositions. [MacManus (2010)] refers to this as "female star power attract[ing] voters" – voters reward parties for having more diverse rolls, especially when party diversity is reflective of national/district diversity. This is not the landscape in cases where systems are defined by SMDs. [Dolan (2014)] notes that the climate is harsher for women and minorities where a party's win yields only a single seat in a district because only the top candidate from each district's roll has a chance to sit in the legislative office. Usually, men are recognized for those top spots, and women's relative difficulty in rising through the party ranks is "justified", simply, on the grounds that they are allegedly less qualified.

Research on Gender-Based Gaps

Of the three categories, the third – research on gender-based gaps – has perhaps gained the most attention by the general public, as an abundance of data substantiates complaints of inequitable workplace and economic treatment that have been at the fore of feminist discourse for decades.

"The Global Gender Gap Report"

The annual "Global Gender Gap Report" – published annually by the World Economic Forum – provides a digestible overview and analysis of how women around the world perform on various indicators, relative to men. The Report, which is based on the same data compiled by the World Bank that are used in my data set, does not compare women's performance, in absolute terms, across countries; rather, it considers how each country's women fare compared to the men in the same country, across a variety of markers that extend well beyond the wage gap, but which are often related to the wage gap in some manner.

The data on which the Report is based are cited by many, if not most, participants in the wage gap discussion, and therefore are central to data-driven contributions to the literature. The Overall Gender Gap Index is divided into topical Subindices. Each Subindex includes ratings on a 0 to 1 scale, which is truncated at 1 when women's performance is equal to or surpasses that of men. The Subindices include Economic Participation and Opportunity (my dependent variable), Educational Attainment, Health and Survival, and Political Empowerment.

The Economic Participation and Opportunity Subindex (EPOS) considers labor force, income, management, and professional worker ratios – all of which are shown to be variables associated with the size of the gap. The mean EPO score is a meager 0.635; no country reaches the benchmark of equality on these indicators. The Educational Attainment Subindex (EAS) offers the most optimism of the Subindices, with a mean score of 0.951, and an impressive score of 0.991 at the 50^{th} percentile. The EAS factors

literacy ratios as well as enrollment ratios at the primary, secondary, and tertiary institution levels. It is the only Subindex for which any countries received ratings of 1.

The Health and Survival Subindex (HSS) shows the highest mean (0.972) of all the Subindices, though the max score reported is 0.98. It is based on only two indicators – sex ratio at birth and the life expectancy gap – and is essentially a simple measure of "the number of years that women and men can expect to live in good health by taking into account the years lost to violence, disease, malnutrition or other relevant factors." Notably, this Subindex does not provide a measure for health *care* or health-related *quality* of life. Numerous sources, including peer-reviewed articles, government publications, NGOs, and mainstream news journalism acknowledge that a pronounced gender gap exists with respect to health care, and that its persistence has profound implications for women's quality of life.

Finally, the most abysmal reportings come from the Political Empowerment Subindex (PES). Included countries have average scores of only 0.169. The very highest score, 0.75 is decidedly anomalous even compared with the score at the 99th percentile, 0.576, and four countries have scored 0 (each over multiple years). The PES is based on ratios for parliamentary seats, ministerial roles, and years with female heads of state.

Women's "Choices" in Economic Participation and Opportunity

Many studies have been devoted to uncovering why these gaps persist. In response to the assumption that women systematically earn less income in comparison to men because they simply elect to limit their earning potential, some such literature has concerned itself with unraveling the notion of women's real "choices". Although many

(though certainly not all) parts of the world have shifted from what [Carli and Eagly (2007)] refer to as a "concrete wall" – that is, from a rigid division of labor that very strictly relegates women exclusively to household roles – several institutional patterns remain that inhibit the ability of many to overcome gendered segmentation. Scholars have roughly categorized those influences that keep women from working as much as men (both in terms of number of hours per week as well as number of total years) as "pull factors" and "push factors", with the former being external obligations and the latter being internal workplace pressures that drive women to leave their jobs [Hewlett, Luce, Shiller, and Southwell (2005)].

Examples of push factors include inflexible workplace structures, such as stingy family leave policies. Where maternity leave is not granted, or where it is not allowed for a sufficient period of time, mothers may feel forced to resign from their jobs altogether. This burden is exacerbated where paternity/partner leave is also restrictive; if a child's other parent is not able to take a needed break from work in these highly demanding times, then the strain falls yet more heavily on the mother. (Much of the focus on parental leave has been on heterosexual parents with newborn children, but more progressive policies have been increasingly inclusive of same-sex couples and of providing paid leave for child adoptions and similar qualifying life events.) Other inflexible policies that crowd out high-performing women may be less obvious, such as disallowing telecommuting and options to adjust the exact hours of one's workday. Though these are facially nondiscriminatory, combined with certain pull factors, they disproportionately affect women.

Among the most-cited pull factors, as identified in *Off-Ramps and On-Ramps: Keeping Talented Women on the Road to Success*, are children and elder care. These are commonly considered "women's issues" because, despite other successes in breaking down the cement wall, the realm of domestic responsibilities nevertheless continues to fall upon women. In the United States, [Gupta (1999); Robinson and Godbey (1997); and South and Spitze (1994)] have found that, as summarized by Carli and Eagly, "having a male partner in the home does not reduce women's housework, nor does a woman's paycheck increase men's housework… In fact, married women do more housework than single women." [Bianchi, Robinson, and Milkie (2006)] furthermore find that when the total number of paid employment hours and of unpaid domestic labor are summed, mothers work an average of seventy-one hours to fathers' average sixty-four hours. As the [U.S. Bureau of Labor Statistics (2006)] has reported, women have a "leisure deficit," with an average of 212 fewer hours of leisure per year than men.

[Hewlett, et al.] have moreover published extensively on their studies regarding American women's ability to "on-ramp" back into professional settings, following what they intend to be temporary departures that are typically taken in response to their push and pull factors. Although 37 percent "of highly qualified women" off-ramp, the amount of time they spend outside of the workforces averages only 2.2 years. Of those women, 93 percent express a desire to return to work, but only 74 percent manage to do so, and of those, only 40 percent do so full-time. Most shockingly, perhaps, is their finding of the "heavy financial penalties" that women face from having taken a brief leave from their careers. On average, women who take an off-ramp lose 18 percent of their earning power, but this number increases for longer off-ramps, and there is variability among sectors.

Those who are lawyers, for example, can expect a 41 percent decrease in their earned income upon returning to work. This coincides with gender wage gaps across age groups: whereas women earn an average of 87 percent of what men earn when considering individuals aged 25-29, that number decreases to 71 percent when considering the 30-40 age bracket.

Other Biases against Women that Affect the Wage Gap

Even when women's conscious decisions to deviate from a continuous, full-time workforce career are controlled for, a gap remains. Much of what would-be-agendered variables – such as number of hours worked, number of years of experience, highest level of education attained, and productivity, etc. – fail to account for can be analyzed as discrimination based on the psychology of prejudice. As [Carli and Eagly (2004)] term it, there exists an observed paradoxical "double-bind" that actively harms women (not only in the workplace, but in ways that can affect all of the aforementioned gender gaps). Women – who were long constrained to the domicile, who continue to be the primary domestic laborers, and who are widely simply assumed to be more nurturing by virtue of their (actual or potential) maternity – are believed to be inherently more calm, gentle, and communal. Men, on the other hand, are assumed to be more naturally endowed with characteristics such as aggressiveness, ambition, and strength. Not coincidentally, this latter set of traits is also generally viewed as being among the traits defining good leaders. Carli and Eagly's Role Congruity Theory posits that working women are doubly punished because they are at once expected to "behave like ladies" and to "behave like leaders". Yet, because stereotypical associations render these two sets to be incongruent,

then women are set up to fail in meeting the acceptable standards of either or both. If women are too "feminine" then it is assumed that they are weak, not bringing their whole selves to the job (because they must be distracted while at work), and unable to meet demands. If women are too "masculine" then they must be failing to meet other (not even work-related) obligations, and they are deemed pushy, bossy, and overall unpleasant.

In arriving at this theory, Carli and Eagly did not merely rest on presumption. Instead, their findings draw from various polling data and blind laboratory research. [Burgoon, Birk, and Hall (1991); Ellyson, Dovidio, and Brown (1992); and Shackelford, Wood, and Worchel (1996)] substantiate this with findings that "women using a self-asserting or threatening style have less influence than men using the same style, or than women using a communal, supportive style." [Thomas-Hunt and Phillips (2004)] find that where male expertise is accepted, the same expertise is more likely to be rejected when delivered by a female. Meanwhile, experiments by [Heilman, Wallenn, Fuchs, and Tamkins (2004)] find that respondents rank descriptions of women lower in reaction to their success in male-dominated industries than they ranked identical descriptions of men. Such often-subconscious prejudices against women detrimentally manifest themselves in the form of performance reviews, evaluations that determine wages and salaries, influence within an organization and a professional field, professional recommendations, and promotions.

Underrepresentation of Women in Leadership

Another critical component of economic participation and opportunity is upward mobility in one's career. In addition to facing unequal pay for equal work, women are

furthermore discriminated against moving up the ranks, especially towards positions of leadership (and of course, higher pay). This concept of a "glass ceiling" was so named in 1968, introduced by Carol Hymonitz and Timothy Schellhardt in a *Wall Street Journal* article, who described that "women eventually crashed into an invisible barrier." And when women do attain high-ranking positions, their tenures at the top tend to be relatively short-lived (which [Ryan and Haslem (2005)] have called the "glass cliff").

Despite the fact that women account for roughly 46 percent of all full-time and part-time workers in the United States, according to the [U.S. Bureau of Labor and Statistics (2007)]; and in spite of women earning 57 percent of bachelors degrees, 59 percent of masters degrees, 48 percent of PhDs, 49 percent of law degrees, and 42 percent of MBAs, per the [U.S. National Center for Education Statistics (2005)]; women are overrepresented at the bottom of workplace hierarchies and scarcely seen in their most influential leadership positions. Summarized by [Kellerman and Rhode (2007)], women hold only 25 percent of upper-level state government positions, and they make up only 25 percent of full professors, 20 percent of college/university presidents, 2 percent of Fortune 500 CEOs, 6 percent of "top earners" and 8 percent of top leaders within those Fortune 500 companies, and less than 20 percent of law firm partners and federal judges. These gaps are wider still for minorities and women of color. In its recently-attained all-time high, only 23.7 percent of the makeup of the Congress of the United States is female.

Additionally, despite the previously-mentioned assumption that women do not reflect the accepted characteristics of what makes a good leader, women and men in fact perform roughly equally on those abilities and traits, as measured in a study by Carli and

Eagly. Where inequality in meeting these did occur – on the measure of ethical behavior – women drastically outperformed men.

Ironically, even financial incentives have not closed the gap on leadership. [Giscombe (2007); Joy (2006); and Yap (2004)] have connected corporate bottom-line performance with gender diversity and find that having women at the top help firms rake in higher profit margins. Giscombe, working for the nonprofit organization, Catalyst, looked at all companies on the Fortune 500 list and concluded that "companies with the highest average representation of women on their top management teams financially outperformed companies with the lowest average representation of women in their top management teams."

This sampling reflects a small fraction of the literature and research dedicated to these critical topics. What remains to be had, however – and what I aim to contribute with this paper – is a policy conversation, based on data, that bridges the discourses of democratic distortion and women's economic inequality. That an economic gap exists pervasively and globally is statistically irrefutable. And because it is both maddening and provable, it is where much of overall gender gap advocacy attention is directed. Also, because of various election results around the world since 2016, the issue of reconsidering Plurality/Majority systems is ripening. People outside of the policy and political science communities are asking whether such systems are effective vehicles for republicanism. Given these considerations, expanding the respective conversations so as to bridge them coherently provides an opportunity for creating political momentum to address both and for increasing our understanding of the effects that electoral policies can

have on entrenching women's economic marginalization. Pursuant to this, the research and literature inform my conceptual model, covered in the next section.

CHAPTER III: CONCEPTUAL MODEL

To test the relationship between electoral system types and gender-based economic gaps, I've constructed a simple theoretical model. The size of the economic participation and opportunity gap, G_W, can be summarized by the following function:

$$G_w = E + G_O + C, \quad (1)$$

where E represents a country's electoral system(s) and electoral system family(-ies) for selecting members of the national legislature, G_o represents the country's broader gender gap, and C represents other statistical conditions in the country that enhance our ability to isolate the electoral system effects by being controlled.

Each of these – E, G_O, and C – is composed of sub-components. E can be unpacked as follows:

$$E = (F_{SE}, S_E) \quad (2)$$

where S_E is the electoral system in place and F_{SE} is the family of systems to which that pertains. In my models, either the system or the system family(-ies) is included as a variable, but not both, due to potential collinearity.

G_O, the overall gender gap, consists of other categorical gender gaps:

$$G_O = G_{EA} + G_{HS} + G_{PE} \quad (3)$$

where G_{EA} is the educational attainment gap, G_{HS} is the health and survival gap, and G_{PE} is the political empowerment gap.

Inclusion of these categorical gaps (which are based on World Bank data subindices bearing the same labels – more on that in the next section) is important because the economic gap is not an isolated aspect of women's treatment relative to men's in a given society. Rather, factors such as those included in each categorical gap are related to women's economic outcomes, not the least of which are wages.

C accounts for other relevant demographic and economic measures which are not included in E or G_O, but which must be included due to their influence on the wage gap. These indicators include GDP (national and per capita) (C_{GDP}), population (C_P), concentration of economic activity (C_{CEC}), educational completion rates (C_{EC}), and population distribution (C_{PD}):

$$C = C_{GDP} + C_P + C_{CEC} + C_{EC} + C_{PD} \quad (4)$$

I now turn to a discussion of the data, which are used to bring this theoretical model into grounded, tangible meaning.

CHAPTER IV: DATA AND METHODS

The data set is a compilation of data from the World Bank's (WB) Open Data, WB Overall Global Gender Gap Index, and from the International Institute for Democracy and Electoral Assistance's (IDEA) Electoral System Design Database.

The WB Global Gender Gap Index includes four subindices that contribute to the assessment of gender equality across key areas – the Global Gender Gap Economic Participation and Opportunity Subindex, the Global Gender Gap Educational Attainment Subindex, the Global Gender Gap Health and Survival Subindex, and the Global Gender Gap Political Empowerment Subindex – as well as ratings valuing each country's annual "overall global gender gap" based on data collected from 2006 through 2016. For each indicator, countries are scored on a truncated 0-1 scale on which 1 denotes either full equality or higher outcomes for women than for men.

The WB Open Data provided additional demographic data that were used as control variable.

IDEA's database provides comparative data indicating the type(s) of electoral system(s) used by each country in its national legislative elections, where applicable. (Countries that do not hold direct public elections are marked as such, but are still included.) The database holds historical data going back to 1991 and is updated following every national legislative election. Electoral systems, which fall under the umbrellas of plurality/majority, mixed, proportional representation, and "other" are categorized into twelve types, with some countries utilizing a combination of systems across legislative bodies. Note that the “mixed” umbrella (or “family,” as these umbrellas will be referred

to henceforth), is what IDEA has termed a specific group of systems; it does not signal that a country has multiple systems in place.

Table 1: Structure of the Global Gender Gap Index[2]

Subindex	Variable	Source
Economic Participation and Opportunity	Ratio: female labor force participation over male value	International Labour Organization (ILO), *Key Indicators of the Labor Market (KILM)* database, 9th edition, 2015
	Wage equality between women and men for similar work (survey data, normalized on a 0-to-1 scale)	World Economic Forum, *Executive Opinion Survey (EOS), 2015-16*
	Ratio: female estimated earned income over male value	World Economic Forum calculations based on the United Nations Development Programme methodology (refer to *Human Development Report 2007/2008*)
	Ratio: female legislators, senior officials and managers over male value	International Labour Organization, *ILOSTAT* database, 2015 or latest available data
	Ratio: female professional and technical workers over male value	International Labour Organization, *ILOSTAT* database, 2015 or latest available data
Educational Attainment	Ratio: female literacy rate over male value	United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics, *Education indicators,* database, 2015 or latest data available; United Nations Development Programme, *Human Development Report 2009,* most recent year available between 1997 and 2007
	Ratio: female net primary enrolment rate over male value	UNESCO Institute for Statistics, *Education indicators* database, 2015 or latest data available
	Ratio: female net secondary enrolment rate over male value	UNESCO Institute for Statistics, Education indicators database, 2015 or latest data available
	Ratio: female gross tertiary enrolment ratio over male value	UNESCO Institute for Statistics, Education indicators database, 2015 or latest data available
Health and Survival	Sex ratio at birth (converted to female-over-male ratio) Ratio: female healthy life expectancy over male value	Central Intelligence Agency, *The CIA World Factbook* 2016, data updated weekly World Health Organization, *Global Health Observatory database,* data from 2013
Political Empowerment	Ratio: females with seats in parliament over male value	Inter-Parliamentary Union, Women in Politics: 2016, reflecting elections/appointments up to 1 June 2016
	Ratio: females at ministerial level over male value	Inter-Parliamentary Union, *Women in Politics: 2015,* reflecting appointments up to 1 January 2015
	Ratio: number of years with a female head of state (last 50 years) over male value	World Economic Forum calculations, reflecting situation as of 30 June 2016

[2] Source: *The Global Gender Gap Report 2016*, World Economic Forum

Table 2: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
Overall Global Gender Gap Index	1478	0.6815291	0.0597125	0.451	0.881
Economic Participation & Opportunity Subindex	1478	0.6350594	0.1190046	0.1951	0.9135
Educational Attainment Subindex	1478	0.9507074	0.0861232	0.4678	1
Health & Survival Subindex	1478	0.9718407	0.0102567	0.919	0.98
Political Empowerment Subindex	1478	0.1685381	0.1257431	0	0.7544
Labor Force Participation Rate	1397	62.56194	10.55324	31.982	89.052
Teen Birth Rate	1617	48.3479	41.86642	1.6676	198.8096
GDP in Current US Dollars	1605	4.59E+11	1.59E+12	6.04E+08	1.86E+13
GDP Annual Growth Rate	1605	3.761861	4.577205	-37.14675	41.6744
GDP Per Capita	1605	14768.42	19955.99	165.8794	119225.4
ES - FPTP*	1606	0.239726	0.4270492	0	1
ES - TRS*	1606	0.0616438	0.2405824	0	1
ES - AV*	1606	0.0068493	0.0825024	0	1
ES - BV*	1606	0.0410959	0.1932889	0	1
ES - PBV*	1606	0.0273973	0.1632889	0	1
ES - Parallel*	1606	0.109589	0.3124741	0	1
ES - MMP*	1606	0.0410959	0.1985738	0	1
ES - List PR*	1606	0.5	0.5001557	0	1
ES - STV*	1606	0.0136986	0.1162729	0	1
ES - SNTV*	1606	0	0	0	0
ES - LV*	1606	0	0	0	0
ES - BC*	1606	0	0	0	0
ESF - Plurality/Majority*	1606	0.3356164	0.4723526	0	1
ESF - Mixed*	1606	0.1506849	0.3578529	0	1
ESF Proportional Representation*	1606	0.5136986	0.499968	0	1
ESF - Other*	1606	0	0	0	0

***indicates that a variable is binary**

Both sources provide data centered on countries as the units of analysis (longitudinally by year, in the case of the WB), which served as the basis of their merging in my dataset. For the WB, this means that the data consider how the women in *each country* fare relative to *the country's men*. One limitation of these indicators is that they consider "women" and "men" as binary genders, and thus, they fail to capture the relative status of individuals who identify with neither gender or with alternative genders, and of those who have transitioned in the gender with which they publicly identify. Another limitation comes from the number of countries (149) for which the WB has gender gap

indices. Most of the omitted countries represent extremes in some of their key identifying characteristics (such as size, government type, security stability, or economic indicators), and so their absence from the data may skew measures of correlation.

In the next section, I detail how I transform my conceptual model into an empirical model.

CHAPTER V: EMPIRICAL MODEL

The equation I have estimated can be generally expressed as:

$$\widehat{economic\ participation\ and\ opportunity\ gap} = \beta_0 + \beta_1 electoral\ system\ or\ electoral\ system\ family + \beta_2 educational\ attainment\ gap + \beta_3 health\ and\ survival\ gap + \beta_4 political\ empowerment\ gap + \beta_5 labor\ force\ participation\ rate + \beta_6 teen\ birth\ rate + \beta_7 GDP\ (in\ current\ dollars) + \beta_8 GDP annual\ growth + \beta_9 GDP\ per\ capita \quad (5)$$

I tested sixteen varieties of this regression model – one for each of the electoral systems and electoral system families. In addition to hypothesizing that Majority/Plurality systems would have negative coefficients and that Proportional Representation systems would have positive coefficients, I also anticipated the behaviors of the control variables. The additional gender gaps – the educational attainment gap, the health and survival gap, and the political empowerment gap – would have positive coefficients, because of the interrelatedness of gender-based inequalities. The labor force participation rate, additionally, would have a positive coefficient; as a larger proportion of the population is engaged in the public economy, I expected that women's opportunities in the market would fare better than in countries where the participation rate is lower and, presumably, more women might not be employed outside of the home. For a similar reason – that is, increased responsibilities at home (including those that would likely arise prior to the attainment of higher or technical education and before/instead of the establishment of a career) – I expected that the teen birth rate would have a negative coefficient; the teen birth rate would increase alongside the decrease of the economic participation and opportunity gender gap index value. I also predicted that the GDP variables would have

positive coefficients, based on [Lagarde's and Ostry's (2018)] findings for the IMF that men's and women's wages increase "as a result of greater inclusion of women in the labor force since productivity will increase."

I now turn to the results I estimated.

CHAPTER VI: EMPIRICAL RESULTS

From estimating this equation for each of the electoral systems and for each of the electoral system families, I have produced a series of statistically robust results with high F-statistics, $\bar{R}^2$s, and coefficients with meaningful interpretations. My results show a clear – albeit small in magnitude – statistically significant relationship between electoral systems and the economic opportunity and participation gender gap.

The two types of systems (or system "families") that, being central to the question being asked, are the most important to this analysis are Plurality/Majority and Proportional Representation. Proportional Representation is used in 51.4 percent of the observations, and Plurality/Majority systems are used in 33.6 percent of the observations. Their importance, then, lies largely in the fact they are predominant among electoral systems, and therefore currently have the most widespread effects. Of Plurality/Majority systems, First Past the Post (FPTP) is the most common, with a presence in 23.9 percent of *all* observations; List PR is the most common of Proportional Representation systems (and of any system, overall) and it is used in 50 percent of all the legislative systems studied.

The regression for Plurality/Majority systems - holding the educational attainment gap (*EduAttainGap*), the health and survivability gap (*HealthSurvivGap*), the political empowerment gap (*PoliticalEmpowerGap*), the labor force participation rate (*laborparticip*), the teen birth rate (*TeenBirthRt*), GDP in current values (*GDPCurrent*), the annual rate of GDP growth (*GDPanngrowth*), and the GDP per capita (*GDPpercap*) constant – (summarized in Table 3) is:

$$\widehat{EconPartiOppGap} = (-0.360363) + (0.0227912)\beta_{\text{ESFPluralityMajority}} + (0.4729452)\beta_{\text{EduAttainGap}} + (0.4401604)\beta_{\text{HealthSurvivGap}} + (0.2068391)\beta_{\text{PoliticalEmpowerGap}} + (0.0002066)\beta_{\text{laborparticip}} + (0.0008659)\beta_{\text{TeenBirthRt}} + (1.44\text{e-}15)\beta_{\text{GDPCurrent}} + (0.0005552)\beta_{\text{GDPanngrowth}} + (1.33\text{e}-06)\beta_{\text{GDPpercap}} \quad (6)$$

The regression for Proportional Representation (summarized in Table 4) with the same control variables, on the other hand, is:

$$\widehat{EconPartiOppGap} = (-0.3135233) + (\text{-}0.0139748)\beta_{\text{ESFPR}} + (0.4659022)\beta_{\text{EduAttainGap}} + (0.4108641)\beta_{\text{HealthSurvivGap}} + (0.1983683)\beta_{\text{PoliticalEmpowerGap}} + (0.0002202)\beta_{\text{laborparticip}} + (0.0009158)\beta_{\text{TeenBirthRt}} + (1.13\text{e-}15)\beta_{\text{GDPCurrent}} + (0.0006318)\beta_{\text{GDPanngrowth}} + (1.41\text{e-}06)\beta_{\text{GDPpercap}} \quad (7)$$

Table 3: Regression Output for Plurality/Majority Electoral System Family

VARIABLES	EconPartiOppGap
ESFPluralityMajority	0.0228***
	(0.00683)
EduAttainGap	0.473***
	(0.0462)
HealthSurvivGap	0.440
	(0.308)
PoliticalEmpowerGap	0.207***
	(0.0269)
laborparticip	0.000207
	(0.000278)
TeenBirthRt	0.000866***
	(0.000108)
GDPCurrent	0
	(0)
GDPanngrowth	0.000555
	(0.000736)
GDPpercap	1.33e-06***
	(2.02e-07)
Constant	-0.360
	(0.293)
Observations	1,260
R-squared	0.212

F(9, 1250) = 37.26
Prob > F = 0.0000

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4: Regression Output for PR Electoral System Family

VARIABLES	EconPartiOppGap
ESFPR	-0.0140**
	(0.00642)
EduAttainGap	0.466***
	(0.0462)
HealthSurvivGap	0.411
	(0.309)
PoliticalEmpowerGap	0.198***
	(0.0269)
laborparticip	0.000220
	(0.000279)
TeenBirthRt	0.000916***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000632
	(0.000738)
GDPpercap	1.41e-06***
	(2.01e-07)
Constant	-0.314
	(0.294)
Observations	1,260
R-squared	0.207

F(9, 1250) = 36.06
Prob > F = 0.0000

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

The comparison of the two equations shows disparate effects between the two electoral system families. All else constant, countries using a Plurality/Majority system could expect to have, at the p<0.01 level of confidence, an economic opportunity and participation gender gap index that is 2.28 percentage points *higher* than those not using a Plurality/Majority system. By contrast, countries using a Proportional Representation

system could expect an economic opportunity and participation gender gap index of 1.40 percentage points *lower* than those without a Proportional Representation system in place, at the $p<0.05$ confidence level.

A similar comparison of the coefficients on List PR and FPTP (summarized in Tables 5 and 6) reveals parallel results. Regressions using the same controls as above predict that List PR is associated with an economic opportunity and participation gender gap index that is lower by 1.04 percentage points, all else constant,

$$\widehat{EconPartiOppGap} = (-0.289) + (-0.0104)\beta_{\text{ESListPR}} + (0.464)\beta_{\text{EduAttainGap}} + (0.386)\beta_{\text{HealthSurvivGap}} + (0.195)\beta_{\text{PoliticalEmpowerGap}} + (0.000222)\beta_{\text{laborparticip}} + (0.000918)\beta_{\text{TeenBirthRt}} + (0)\beta_{\text{GDPCurrent}} + (0.000629)\beta_{\text{GDPanngrowth}} + (1.40\text{e-}06)\beta_{\text{GDPpercap}}, \quad (8)$$

while FPTP is associated with an index that is higher by 4.77 percentage points, all else constant:

$$\widehat{EconPartiOppGap} = (-0.455) + (0.0477)\beta_{\text{ESFPTP}} + (0.482)\beta_{\text{EduAttainGap}} + (0.529)\beta_{\text{HealthSurvivGap}} + (0.208)\beta_{\text{PoliticalEmpowerGap}} + (0.000205)\beta_{\text{laborparticip}} + (0.000786)\beta_{\text{TeenBirthRt}} + (0)\beta_{\text{GDPCurrent}} + (0.000585)\beta_{\text{GDPanngrowth}} + (1.34\text{e-}06)\beta_{\text{GDPpercap}}. \quad (9)$$

Table 5: Regression Output for List PR Electoral Systems

VARIABLES	EconPartiOppGap
ESListPR	-0.0104
	(0.00637)
EduAttainGap	0.464***
	(0.0462)
HealthSurvivGap	0.386
	(0.310)
PoliticalEmpowerGap	0.195***
	(0.0268)
laborparticip	0.000222
	(0.000279)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000629
	(0.000738)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.289
	(0.295)
Observations	1,260
R-squared	0.206

F(9, 1250) = 36.07
Prob > F = 0.0000

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6: Regression Output for First-Past-the-Post Electoral Systems

VARIABLES	EconPartiOppGap
ESFPTP	0.0477***
	(0.00740)
EduAttainGap	0.482***
	(0.0456)
HealthSurvivGap	0.529*
	(0.303)
PoliticalEmpowerGap	0.208***
	(0.0261)
laborparticip	0.000205
	(0.000275)
TeenBirthRt	0.000786***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000585
	(0.000727)
GDPpercap	1.34e-06***
	(1.99e-07)
Constant	-0.455
	(0.289)
Observations	1,260
R-squared	0.230

F(9, 1250) = 41.50
Prob > F = 0.0000

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Several countries among the observations use a combination of multiple electoral systems to elect their legislatures (this is sometimes done, for example, by using different systems to elect members to different legislative chambers). Isolating countries that use *only* List PR systems and those that use *only* FPTP indicates that having multiple systems in play slightly increases the economic opportunity and participation gender gap index

effects of using a single system. The mean index among states where List PR is used is 0.6427917, but the mean index among states where List PR is used *exclusively* is the slightly lower 0.6421307. On the other hand, countries using FPTP have a mean index of 0.6576957, but those that use it *exclusively* have a mean index of 0.68355, which is slightly higher. Though these differences may not be impressive in magnitude, they indicate that FPTP acting alone is better for women's economic equality, whereas List PR acting alone worsens its prospects.

Overall, Proportional Representation, contrary to my expectations, decreased the women's economic opportunity and participation index; Plurality/Majority and Mixed both increased the index (and therefore decreased the actual gap). The individual systems that are associated with a lower index (and the respective percentage point changes) are TRS (-5.33), BV (-2.83), PBV (-2.49), MMP (-0.08), List PR (-1.04), and STV (-4.83). Those that have a relationship in the opposite direction are FPTP (4.77), AV (6.86), and Parallel (1.57). (The full results from these regressions are included in the Appendix. None of my observations use electoral systems in the "Other" family, so the effects of that family and of the three systems within it could not be tested. Regressions for these were run in STATA, and their outputs are included in the Appendix for readers' reference, but as the independent variables of interest are omitted, they offer only coefficients for the control variables irrespective of electoral rules.)

Based on further investigation, it appears that a possible explanation for my confounded expectations lies at least partly with a country's overall socioeconomic conditions. For example, despite controlling for three aspects of GDP in my regressions, restricting the sample size by GDP per capita reveals a more nuanced view of the

dynamics at work. Specifically, when Proportional Representation and List PR are tested only on countries in which the GDP per capita is above $19,000 (in US constant dollars), their coefficients are positive, indicating that in wealthier countries, these types of systems are helpful for women's economic equality. Additionally, the coefficients on Plurality/Majority and on FPTP remain positive when testing this same group of countries, but for these systems, there is also a pronounced effect, with the magnitude of the coefficients being significantly higher than they are when all countries, countries with a GDP per capita <$19,000 only, or countries with a GDP per capita <$5,000 are analyzed. These findings demonstrate that election systems and election system families interact with economic indicators to impact the economic participation and opportunity gap – a question that I recommend for future research. The OLS results for the tests I have mentioned here are included in Appendix B.

My control variables are consistently attached to positive coefficients, across all regressions. This is especially unsurprising for the other gender gap index variables – *EduAttainGap*, *HealthSurvivGap*, and *PoliticalEmpowerGap* – and for *TeenBirthRt*. As gaps in education increase, opportunities for equality in employment, promotion, and earnings understandably likewise increase. With unequal health care and outcomes, as with childbearing (which disproportionately affects biological females) in years prior to the completion of secondary and tertiary education and the establishment of a career trajectory, women become less able to direct as much of their attention and energy towards economically prosperous endeavors. A higher political empowerment gap between men and women is furthermore linked with higher economic disparity. Several studies have shown a statistically significant positive relationship between the number of

women in a country's legislature and the number of public policies that the legislature creates in favor of women's equality (Rolfes-Haase, 2017). In the United States, [Swers (2002)] reports that female members of Congress are also taking the lead in introducing and promoting bills that advocate for "women's issues" and are more likely to favor such legislation in roll call voting.

Also consistent across models, regardless of the electoral system(s), are the estimated effects of labor force participation, GDP, GDP annual growth, and GDP per capita. In every instance, the magnitude of each appears small, but this is misleading. Using the coefficients from the Plurality/Majority regression as an example, each percentage point increase in *laborparticip* is expected, all else constant, to increase a country's economic participation and opportunity index value by 0.000207; a change in *GDPCurrent* is predicted to have no effect on the dependent variable (DV); a percentage point increase in *GDPanngrowth* is estimated to increase the dependent variable by 0.000555 (and *GDPanngrowth* would have to increase by 180.18 percentage points to increase the DV by 0.1); and a $1 (US) increase in *GDPpercap* is expected to increase the dependent variable by 0.000000202 (and *GDPpercap* would have to increase by $495,000 to increase the DV by 0.1). Though these numbers appear negligible on the surface, their inclusion actually increases the explanatory strength of the regressions (as indicated by their *F*-Statistics), and *GDPCurrent* is furthermore highly statistically significant as an individual variable (per its comparative *p*-values).

I now turn to the policy implications of these results.

CHAPTER VII: CONCLUSIONS AND POLICY RECOMMENDATIONS

What I sought to learn was whether the representation distortions from Plurality/Majority systems extended to affect the gender wage gap. Because reliable international data for a wage gap variable was inaccessible, I replaced the wage gap in my query by looking at the World Bank's Economic Participation and Opportunity Gap Subindex, which not only incorporates the wage gap, but also incorporates other measures of economic disparity that complement the wage gap. Using this proxy as my dependent variable, I constructed OLS models to test electoral systems and electoral systems as my respective independent variables of interest, alongside several demographic control variables. Unexpectedly, my final results show a positive correlation between Plurality/Majority systems and higher gender-based economic equality and a negative correlation between Proportional Representation systems and gender-based economic equality. However, there are some indications that at a certain level of development, some of these relationships reverse, and thus Proportional Representation systems become harmful to women's economic advancement. In response to these findings, I recommend the following:

Electoral Reform

The most targeted solution to the problem uncovered would be for governments to implement proportional representation systems for electing legislators, in countries where the GDP per capita is >$19,000. Such reform would be expected to not only reduce the

wage gap, but to more broadly address the problem of underrepresentation on issues that differently or disproportionately affect women.

A glaring obstacle against this proposal is that its proponents would face a difficult political response. One reason for this would be that changing an electoral system is drastic. To do so would, in most cases, require constitutional (not merely statutory or regulatory) reformulation. Additionally, the way in which a population votes can be seen as a central component to its democratic identity – elections are often routinized to the point of being ritualistic. Voters can be accustomed to a set of procedures, while pundits and journalists may have decades invested in understanding existing institutions and patterns as an aspect of their very careers. A second reason for resistance is that altering systems of power threatens those *who already hold* power; lawmakers in office have benefitted from the status quo (at least to the extent that it has allowed them to ascend to their positions), and therefore have a direct stake in maintaining existing electoral conditions, lest reforms prevent them from securing reelection.

Cabinet Reform and Department Creation

A less direct approach (in that it would not be specifically targeted at electoral systems), but which could nevertheless redress many gender-based policy shortcomings while presumably finding less political hostility would be to create a cabinet/ministerial seat, accompanied by a department, tasked with overseeing issues that disproportionately affect women. This type of department would, much like the Department of Homeland Security in the United States, work collaboratively with other agencies – i.e. with the

Equal Employment Opportunity Commission on labor employment issues, with the Department of Justice on domestic and sexual violence, with the Department of Health and Human Services on health and medical concerns, etc. – to ensure that women are considered in all areas in which a government is involved. Politically, this may meet some resistance (in large part due to the same power dynamics of status quo beneficiaries discussed above), but given its focus on roughly half of the population, and recent shifts in political mobilization (especially since President Trump's election, both in the US and in countries that closely engage with the US), it stands a greater chance at success in the interim until calls for electoral reform gain more traction.

Improvements in Data

Originally, my intention was to analyze the gender wage gap as my dependent variable. Despite allusions to the wage gap as a component of the *EconPartiOppGap*, it is only (publicly) available as an isolated variable by the same sources for the year 2016. Alternative sources that provide (or purport to provide) these data, however, either only do so for a very narrow segment of the global population (making it limited in its comparative application) or base their figures on perception polls (which are unreliable for this type of information). Even for the broader, semi-proxy *EconPartiOppGap*, though, data points are still lacking for several countries, with omissions skewed toward places with low-performing economic indicators, overall opacity, and/or what US-based scholars might consider to be "extremist" and socially "regressive" patriarchal policies that restrict women's rights and opportunities. For continued studies, which I discuss

next, better data – and especially solid data on the gender wage gap – are critically necessary.

Further Study

While this study considers the effects of electoral systems on the gender-based economic opportunity and participation gap, specifically, I speculate that similar relationships exist between electoral systems and other indicators of women's and minorities' well-being. As the data have shown, only in terms of educational attainment are women globally performing nearly as well as men, and thus, many gaps remain to be closed. But many mistakenly believe that in the absence of facially discriminatory laws, achieving equality, equity, and justice are left strictly in the hands of the public, and that the government's role is exhausted. However, by continuing to analyze and consider those systemic factors that perpetuate inequality and allow "gaps" to remain pervasive, governments and the publics they represent can be better equipped to represent all individuals more closely.

APPENDIX A: REGRESSION RESULTS ON ALL ELECTORAL SYSTEMS AND ELECTORAL SYSTEM FAMILIES TESTED

For all of the following results, Standard errors in parentheses, *** indicates p<0.01, ** indicates p<0.05, and * indicates p<0.1.

Table A1: Regression Output for First-Past-the-Post Electoral Systems

VARIABLES	EconPartiOppGap
ESFPTP	0.0477***
	(0.00740)
EduAttainGap	0.482***
	(0.0456)
HealthSurvivGap	0.529*
	(0.303)
PoliticalEmpowerGap	0.208***
	(0.0261)
laborparticip	0.000205
	(0.000275)
TeenBirthRt	0.000786***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000585
	(0.000727)
GDPpercap	1.34e-06***
	(1.99e-07)
Constant	-0.455
	(0.289)
Observations	1,260
R-squared	0.230

F(9, 1250) = 41.50
Prob > F = 0.0000

Table A2: Regression Output for TRS Electoral Systems

VARIABLES	EconPartiOppGap
ESTRS	-0.0533***
	(0.0121)
EduAttainGap	0.445***
	(0.0459)
HealthSurvivGap	0.275
	(0.304)
PoliticalEmpowerGap	0.175***
	(0.0262)
laborparticip	0.000248
	(0.000278)
TeenBirthRt	0.000887***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000730
	(0.000733)
GDPpercap	1.39e-06***
	(2.00e-07)
Constant	-0.162
	(0.289)
Observations	1,260
R-squared	0.217

F(9, 1250) = 38.39
Prob > F = 0.0000

Table A3: Regression Output for AV Electoral Systems

VARIABLES	EconPartiOppGap
ESAV	0.0686**
	(0.0341)
EduAttainGap	0.456***
	(0.0461)
HealthSurvivGap	0.310
	(0.306)
PoliticalEmpowerGap	0.190***
	(0.0263)
laborparticip	0.000219
	(0.000279)
TeenBirthRt	0.000910***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000626
	(0.000738)
GDPpercap	1.33e-06***
	(2.05e-07)
Constant	-0.212
	(0.291)
Observations	1,260
R-squared	0.207

F(9, 1250) = 36.27
Prob > F = 0.0000

Table A4: Regression Output for BV Electoral Systems

VARIABLES	EconPartiOppGap
ESBV	-0.0283*
	(0.0171)
EduAttainGap	0.458***
	(0.0461)
HealthSurvivGap	0.294
	(0.306)
PoliticalEmpowerGap	0.177***
	(0.0269)
laborparticip	0.000210
	(0.000279)
TeenBirthRt	0.000908***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000764
	(0.000741)
GDPpercap	1.46e-06***
	(2.04e-07)
Constant	-0.194
	(0.291)
Observations	1,260
R-squared	0.206

F(9, 1250) = 36.09
Prob > F = 0.0000

Table A5: Regression Output for PBV Electoral Systems

VARIABLES	EconPartiOppGap
ESPBV	-0.0249
	(0.0193)
EduAttainGap	0.443***
	(0.0477)
HealthSurvivGap	0.325
	(0.306)
PoliticalEmpowerGap	0.182***
	(0.0265)
laborparticip	0.000213
	(0.000280)
TeenBirthRt	0.000933***
	(0.000108)
GDPCurrent	0
	(0)
GDPanngrowth	0.000648
	(0.000739)
GDPpercap	1.43e-06***
	(2.02e-07)
Constant	-0.213
	(0.291)
Observations	1,260
R-squared	0.206

F(9, 1250) = 35.94
Prob > F = 0.0000

Table A6: Regression Output for Parallel Electoral Systems

VARIABLES	EconPartiOppGap
ESParallel	0.0157*
	(0.00950)
EduAttainGap	0.464***
	(0.0462)
HealthSurvivGap	0.310
	(0.306)
PoliticalEmpowerGap	0.187***
	(0.0263)
laborparticip	0.000215
	(0.000279)
TeenBirthRt	0.000928***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000725
	(0.000739)
GDPpercap	1.44e-06***
	(2.03e-07)
Constant	-0.222
	(0.291)
Observations	1,260
R-squared	0.206

F(9, 1250) = 36.08
Prob > F = 0.0000

Table A7: Regression Output for MMP Electoral Systems

VARIABLES	EconPartiOppGap
ESMMP	0.000770
	(0.0142)
EduAttainGap	0.458***
	(0.0463)
HealthSurvivGap	0.310
	(0.307)
PoliticalEmpowerGap	0.186***
	(0.0265)
laborparticip	0.000217
	(0.000280)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000663
	(0.000739)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.213
	(0.293)
Observations	1,260
R-squared	0.204

F(9, 1250) = 35.70
Prob > F = 0.0000

Table A8: Regression Output for List PR Electoral Systems

VARIABLES	EconPartiOppGap
ESListPR	-0.0104
	(0.00637)
EduAttainGap	0.464***
	(0.0462)
HealthSurvivGap	0.386
	(0.310)
PoliticalEmpowerGap	0.195***
	(0.0268)
laborparticip	0.000222
	(0.000279)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000629
	(0.000738)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.289
	(0.295)
Observations	1,260
R-squared	0.206

F(9, 1250) = 36.07
Prob > F = 0.0000

Table A9: Regression Output for STV Electoral Systems

VARIABLES	EconPartiOppGap
ESSTV	-0.0483**
	(0.0242)
EduAttainGap	0.458***
	(0.0461)
HealthSurvivGap	0.308
	(0.306)
PoliticalEmpowerGap	0.189***
	(0.0263)
laborparticip	0.000203
	(0.000279)
TeenBirthRt	0.000912***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000710
	(0.000738)
GDPpercap	1.45e-06***
	(2.03e-07)
Constant	-0.211
	(0.291)
Observations	1,260
R-squared	0.207

F(9, 1250) = 36.26
Prob > F = 0.0000

Table A10: Regression Output for LV Electoral Systems

VARIABLES	EconPartiOppGap
o.ESLV	-
EduAttainGap	0.458***
	(0.0461)
HealthSurvivGap	0.311
	(0.306)
PoliticalEmpowerGap	0.186***
	(0.0263)
laborparticip	0.000217
	(0.000280)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000662
	(0.000739)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.214
	(0.291)
Observations	1,260
R-squared	0.204

F(9, 1250) = 40.20
Prob > F = 0.0000

Table A11: Regression Output for SNTV Electoral Systems

VARIABLES	EconPartiOppGap
o.ESSNTV	-
EduAttainGap	0.458***
	(0.0461)
HealthSurvivGap	0.311
	(0.306)
PoliticalEmpowerGap	0.186***
	(0.0263)
laborparticip	0.000217
	(0.000280)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000662
	(0.000739)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.214
	(0.291)
Observations	1,260
R-squared	0.204

F(9, 1250) = 40.20
Prob > F = 0.0000

Table A12: Regression Output for BC Electoral Systems

VARIABLES	EconPartiOppGap
o.ESBC	-
EduAttainGap	0.458***
	(0.0461)
HealthSurvivGap	0.311
	(0.306)
PoliticalEmpowerGap	0.186***
	(0.0263)
laborparticip	0.000217
	(0.000280)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000662
	(0.000739)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.214
	(0.291)
Observations	1,260
R-squared	0.204

F(9, 1250) = 40.20
Prob > F = 0.0000

Table A13: Regression Output for Plurality/Majority Electoral System Family

VARIABLES	EconPartiOppGap
ESFPluralityMajority	0.0228***
	(0.00683)
EduAttainGap	0.473***
	(0.0462)
HealthSurvivGap	0.440
	(0.308)
PoliticalEmpowerGap	0.207***
	(0.0269)
laborparticip	0.000207
	(0.000278)
TeenBirthRt	0.000866***
	(0.000108)
GDPCurrent	0
	(0)
GDPanngrowth	0.000555
	(0.000736)
GDPpercap	1.33e-06***
	(2.02e-07)
Constant	-0.360
	(0.293)
Observations	1,260
R-squared	0.212

F(9, 1250) = 37.26
Prob > F = 0.0000

Table A14: Regression Output for Mixed Electoral System Family

VARIABLES	EconPartiOppGap
ESFMixed	0.0119
	(0.00818)
EduAttainGap	0.459***
	(0.0461)
HealthSurvivGap	0.292
	(0.307)
PoliticalEmpowerGap	0.185***
	(0.0263)
laborparticip	0.000216
	(0.000279)
TeenBirthRt	0.000922***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000725
	(0.000740)
GDPpercap	1.44e-06***
	(2.03e-07)
Constant	-0.199
	(0.291)
Observations	1,260
R-squared	0.206

F(9, 1250) = 36.00
Prob > F = 0.0000

Table A15: Regression Output for PR Electoral System Family

VARIABLES	EconPartiOppGap
ESFPR	-0.0140**
	(0.00642)
EduAttainGap	0.466***
	(0.0462)
HealthSurvivGap	0.411
	(0.309)
PoliticalEmpowerGap	0.198***
	(0.0269)
laborparticip	0.000220
	(0.000279)
TeenBirthRt	0.000916***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000632
	(0.000738)
GDPpercap	1.41e-06***
	(2.01e-07)
Constant	-0.314
	(0.294)
Observations	1,260
R-squared	0.207

F(9, 1250) = 36.06
Prob > F = 0.0000

Table A16: Regression Output for Family of Electoral Systems Grouped as "Other"

VARIABLES	EconPartiOppGap
o.ESFOther	-
EduAttainGap	0.458***
	(0.0461)
HealthSurvivGap	0.311
	(0.306)
PoliticalEmpowerGap	0.186***
	(0.0263)
laborparticip	0.000217
	(0.000280)
TeenBirthRt	0.000918***
	(0.000107)
GDPCurrent	0
	(0)
GDPanngrowth	0.000662
	(0.000739)
GDPpercap	1.40e-06***
	(2.02e-07)
Constant	-0.214
	(0.291)
Observations	1,260
R-squared	0.204

F(9, 1250) = 40.20
Prob > F = 0.0000

APPENDIX B: REGRESSION RESULTS ON THE ELECTORAL SYSTEMS AND FAMILIES OF INTEREST, RESTRICTING FOR GDP PER CAPITA

For all of the following results, Standard errors in parentheses, *** indicates p<0.01, ** indicates p<0.05, and * indicates p<0.1.

Table B1: Regression Output for Plurality/Majority Electoral System Family, if GDP per capita > $19,000

VARIABLES	EconPartiOppGap
ESFPluralityMajority	0.0476***
	(0.0117)
EduAttainGap	0.751*
	(0.421)
HealthSurvivGap	2.648***
	(0.888)
PoliticalEmpowerGap	0.295***
	(0.0332)
laborparticip	7.17e-05
	(0.000412)
TeenBirthRt	0.00151**
	(0.000708)
GDPCurrent	-0
	(0)
GDPanngrowth	-0.00526***
	(0.00150)
GDPpercap	1.70e-06***
	(2.64e-07)
Constant	-2.818***
	(0.917)
Observations	343
R-squared	0.465

F(9, 333) = 32.14
Prob > F = 0.0000

Table B2: Regression Output for Plurality/Majority Electoral System Family, if GDP per capita < $19,000

VARIABLES	EconPartiOppGap
ESFPluralityMajority	0.0171**
	(0.00832)
EduAttainGap	0.503***
	(0.0512)
HealthSurvivGap	0.225
	(0.369)
PoliticalEmpowerGap	0.0894**
	(0.0397)
laborparticip	0.000169
	(0.000346)
TeenBirthRt	0.000837***
	(0.000124)
GDPCurrent	-0
	(0)
GDPanngrowth	0.00172**
	(0.000855)
GDPpercap	6.98e-07
	(9.92e-07)
Constant	-0.155
	(0.354)
Observations	917
R-squared	0.138

F(9, 907) = 16.17
Prob > F = 0.0000

Table B3: Regression Output for Plurality/Majority Electoral System Family, if GDP per capita < $5,000

VARIABLES	EconPartiOppGap
ESFPluralityMajority	0.0104
	(0.0109)
EduAttainGap	0.595***
	(0.0605)
HealthSurvivGap	0.0878
	(0.434)
PoliticalEmpowerGap	0.00501
	(0.0520)
laborparticip	0.000292
	(0.000449)
TeenBirthRt	0.000816***
	(0.000148)
GDPCurrent	-0**
	(0)
GDPanngrowth	0.00380***
	(0.00106)
GDPpercap	-1.83e-05***
	(4.29e-06)
Constant	-0.0619
	(0.416)
Observations	564
R-squared	0.210

F(9, 554) = 16.36
Prob > F = 0.0000

Table B4: Regression Output for Proportional Representation Electoral System Family, if GDP per capita > $19,000

VARIABLES	EconPartiOppGap
ESFPR	0.00841
	(0.0121)
EduAttainGap	0.280
	(0.433)
HealthSurvivGap	2.055**
	(0.916)
PoliticalEmpowerGap	0.262***
	(0.0346)
laborparticip	0.000108
	(0.000421)
TeenBirthRt	0.00246***
	(0.000732)
GDPCurrent	0
	(0)
GDPanngrowth	-0.00499***
	(0.00154)
GDPpercap	1.74e-06***
	(2.71e-07)
Constant	-1.774*
	(0.950)
Observations	343
R-squared	0.439

F(9, 333) = 28.98
Prob > F = 0.0000

Table B5: Regression Output for Proportional Representation Electoral System Family, if GDP per capita < $19,000

VARIABLES	EconPartiOppGap
ESFPR	-0.0232***
	(0.00764)
EduAttainGap	0.504***
	(0.0510)
HealthSurvivGap	0.226
	(0.366)
PoliticalEmpowerGap	0.0903**
	(0.0392)
laborparticip	0.000177
	(0.000345)
TeenBirthRt	0.000881***
	(0.000122)
GDPCurrent	-0
	(0)
GDPanngrowth	0.00180**
	(0.000852)
GDPpercap	1.00e-06
	(9.95e-07)
Constant	-0.144
	(0.350)
Observations	917
R-squared	0.143

F(9, 907) = 16.81
Prob > F = 0.0000

Table B6: Regression Output for Proportional Representation Electoral System Family, if GDP per capita < $5,000

VARIABLES	EconPartiOppGap
ESFPR	-0.0135
	(0.0103)
EduAttainGap	0.591***
	(0.0605)
HealthSurvivGap	0.101
	(0.434)
PoliticalEmpowerGap	0.00218
	(0.0509)
laborparticip	0.000264
	(0.000449)
TeenBirthRt	0.000850***
	(0.000144)
GDPCurrent	-0**
	(0)
GDPanngrowth	0.00380***
	(0.00106)
GDPpercap	-1.73e-05***
	(4.42e-06)
Constant	-0.0632
	(0.416)
Observations	564
R-squared	0.211

F(9, 554) = 16.47
Prob > F = 0.0000

Table B7: Regression Output for FPTP Electoral Systems, if GDP per capita > $19,000

VARIABLES	EconPartiOppGap
ESFPTP	0.110***
	(0.0147)
EduAttainGap	1.437***
	(0.414)
HealthSurvivGap	1.662**
	(0.836)
PoliticalEmpowerGap	0.272***
	(0.0309)
laborparticip	0.000107
	(0.000390)
TeenBirthRt	-0.000298
	(0.000732)
GDPCurrent	-0
	(0)
GDPanngrowth	-0.00447***
	(0.00142)
GDPpercap	1.54e-06***
	(2.52e-07)
Constant	-2.512***
	(0.848)
Observations	343
R-squared	0.520

F(9, 333) = 40.11
Prob > F = 0.0000

Table B8: Regression Output for FPTP Electoral Systems, if GDP per capita < $19,000

VARIABLES	EconPartiOppGap
ESFPTP	0.0338***
	(0.00876)
EduAttainGap	0.509***
	(0.0508)
HealthSurvivGap	0.351
	(0.368)
PoliticalEmpowerGap	0.0939**
	(0.0391)
laborparticip	0.000172
	(0.000344)
TeenBirthRt	0.000785***
	(0.000124)
GDPCurrent	-0
	(0)
GDPanngrowth	0.00170**
	(0.000849)
GDPpercap	5.23e-07
	(9.87e-07)
Constant	-0.283
	(0.353)
Observations	917
R-squared	0.148

F(9, 907) = 17.53
Prob > F = 0.0000

Table B9: Regression Output for FPTP Electoral Systems, if GDP per capita < $5,000

VARIABLES	EconPartiOppGap
ESFPTP	0.0131
	(0.0111)
EduAttainGap	0.596***
	(0.0605)
HealthSurvivGap	0.0871
	(0.434)
PoliticalEmpowerGap	0.00131
	(0.0509)
laborparticip	0.000291
	(0.000449)
TeenBirthRt	0.000807***
	(0.000148)
GDPCurrent	-0**
	(0)
GDPanngrowth	0.00383***
	(0.00106)
GDPpercap	-1.83e-05***
	(4.27e-06)
Constant	-0.0608
	(0.416)
Observations	564
R-squared	0.211

F(9, 554) = 16.43
Prob > F = 0.0000

Table B10: Regression Output for List PR Electoral Systems, if GDP per capita > $19,000

VARIABLES	EconPartiOppGap
ESListPR	0.0230*
	(0.0119)
EduAttainGap	0.169
	(0.428)
HealthSurvivGap	1.905**
	(0.907)
PoliticalEmpowerGap	0.253***
	(0.0341)
laborparticip	8.95e-05
	(0.000419)
TeenBirthRt	0.00282***
	(0.000745)
GDPCurrent	0
	(0)
GDPanngrowth	-0.00476***
	(0.00153)
GDPpercap	1.71e-06***
	(2.70e-07)
Constant	-1.526
	(0.936)
Observations	343
R-squared	0.445

F(9, 333) = 29.62
Prob > F = 0.0000

Table B11: Regression Output for List PR Electoral Systems, if GDP per capita < $19,000

VARIABLES	EconPartiOppGap
ESListPR	-0.0226***
	(0.00763)
EduAttainGap	0.504***
	(0.0510)
HealthSurvivGap	0.225
	(0.366)
PoliticalEmpowerGap	0.0898**
	(0.0393)
laborparticip	0.000177
	(0.000345)
TeenBirthRt	0.000881***
	(0.000122)
GDPCurrent	-0
	(0)
GDPanngrowth	0.00180**
	(0.000852)
GDPpercap	9.80e-07
	(9.94e-07)
Constant	-0.143
	(0.350)
Observations	917
R-squared	0.143

F(9, 907) = 16.76
Prob > F = 0.0000

Table B12: Regression Output for List PR Electoral Systems, if GDP per capita < $5,000

VARIABLES	EconPartiOppGap
ESListPR	-0.0135
	(0.0103)
EduAttainGap	0.591***
	(0.0605)
HealthSurvivGap	0.101
	(0.434)
PoliticalEmpowerGap	0.00218
	(0.0509)
laborparticip	0.000264
	(0.000449)
TeenBirthRt	0.000850***
	(0.000144)
GDPCurrent	-0**
	(0)
GDPanngrowth	0.00380***
	(0.00106)
GDPpercap	-1.73e-05***
	(4.42e-06)
Constant	-0.0632
	(0.416)
Observations	564
R-squared	0.211

F(9, 554) = 16.47
Prob > F = 0.0000

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