The Impacts of Colonial Institutions on Gender Equality

A Thesis

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by

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Abstract

This paper examines whether past institutions affect current gender inequality (measured by Women, Business and the Law Index) in 63 former colonies by considering government effectiveness throughout the past two decades. Also, the early settlement of Europeans and the level of democracy at the year of dependence are used as instruments for past institutions, assuming that those factors contribute to current governance and, thereby institutions. By conducting a cross-sectional analysis and a panel data analysis separately, it turned out that (1) the quality of current institutions is significant for determining WBL in neo-Europes and Africa, while (2) female representation in the labor force as well as national parliaments are crucial in the long term. In addition to result (1), the analysis also confirms path dependency of institutions and the influences that may affect gender equality at present, though mostly limited to neo-Europes. These results suggest that institutions might not be the top priority if a gender-equal society is intended, but the influences from the past remain in countries having the strongest connection with its former suzerain. Moreover, as the previous literature claims, increasing female representation in politics and the labor market will be the impetus for equality.

Keywords: Gender equality; Women, Business and the Law Index (WBL); Colonial institutions; Governance

JEL Classification Number: C12, C31, C33, C36, D02, D63, Z13

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Section I: Introduction

There is gender inequality in numerous perspectives: political representation, norms, education, labor force participation, earnings, and so on. Though being argued against by some studies, gender equality is not only crucial from an ideological point of view but also contributes to improving the efficiency of the overall economy. Previous research showed that there was a mutual causality between women's empowerment and economic development (Duflo, 2012). Approximately 40% of the growth in U.S. market GDP per capita was explained by removed barriers against women and people of color in the labor market and education (Hsieh et al., 2019), and regional differences in economic growth were also partially attributable to gender gaps in employment (Klasen and Lamanna, 2009). On a household basis, the effects of uncarned income on a family's health became larger when mothers controlled and allocated the income (Thomas, 1990). A more recent study by Malapit et al (2015) also revealed that the empowerment of women in agriculture improved children's height along with dietary diversity in Nepal. Recently, Claudia Goldin's winning the Nobel Prize in Economic Sciences also shed light on women's participation and presence in economic activities.

Despite all the advantages and necessity, the current situation has been problematic globally. Estimation by the World Economic Forum shows that 131 years are needed to completely close the gender gap; for the Middle East and North Africa, it will take 152 years (World Economic Forum, 2023). Another indicator of gender parity, which is the Women, Business and the Law Index published by the World Bank (hereafter WBL Index) also depicts a regionally dispersed progress in institutional equality of gender. In the WBL Index, the main focus is whether women are ensured to exert the same rights as men in the following eight domains: mobility, workplace, pay, marriage, parenthood, entrepreneurship, assets, and pension. Figure 1 illustrates the trends of the WBL Index in several regions with total performance below the global average, while Figure 2 is the breakdown of each indicator in 2023. Though with differences among achievement in the subindices, these regions are all far from parity.



Figure 1: WBL Index (2023) and progress over time

Source: World Bank (2023). Notes: EAP=East Asia & Pacific, SAR=South Asia, MENA=Middle East & North Africa.



Figure 2: Performance by indicators and regions (2023)

Source: World Bank (2023).

As mentioned above, there are various ways to consider the issue. Literature in economics provides us with especially detailed and abundant analyses regarding the effects of disparity, as will be reviewed later; however, less attention is paid to the causes, i.e., what has led to the current situation. The problem is, that if we do not clarify the causes, the antidotes might be, if not totally, ineffective. To consider the causes of a certain phenomenon, I would like to refer to *path dependency*. In terms of economics, one well-known example of path dependency is the prevalence of the QWERTY keyboard articulated by David (1985) and Arthur (1989), showing the sequence of changes that led to its wide adoption. The key here is that once such a path is established, the dominant choice will no longer change even if more efficient technology (in this case, a more convenient arrangement of the keyboard) appears. Several studies in politics applied this concept and suggested that institutions are formed within the realm of shared cognitions, as exemplified in Katzenstein's work (1996) which discussed the impacts of social norms on political interests and eventually the Japanese security policy.

Thus, investigating the history of gender equality provides us with its path, and enables us to figure out whether there was path dependency. If so, policies to achieve gender equality should also take into consideration society-specific factors such as norms and institutions resulting from history; if not, we shall confirm that the path to gender equality is not narrowed by the past, and there must be other impetus of equality. In this paper, I will try to analyze the historical causes of institutional gender disparity at present, and the predominant purpose of this research is to reveal the influences brought by former suzerains to the (in)equality of gender in former colonies.

There are two reasons to focus on former colonies. Firstly, the majority of them are still categorized as developing countries and often suffer more from the gender gap, though with some exceptions such as the United States and Australia. Secondly, Thelen (1999) pointed out that exogenous shocks cannot be ignored when considering the formation of institutions. Colonialism is by no means a phenomenon that occurred within those countries, but rather a system exogenously introduced. Therefore, examining colonial impacts on institutions may also provide some implications regarding the extent to which endogenous reforms are effective.

Before moving to the next section, I will discuss the importance of research combining distinct fields or frameworks. Historical factors, which are the focus of this paper, are sometimes deemed too ambiguous to quantify. Also, due to the tendency to focus on specific and individual contexts, a historical approach might seem inadequate for deducing generalizable principles. Nonetheless, the explanation regarding development in institutionalism by Thelen (1999, p.370) seems reasonable enough for the author to combine historical context with an empirical approach, thereby trying to figure out general patterns and causes of change. The following quote also implies the possibility of inter-disciplinary research:

The walls dividing the three perspectives (note: different schools in institutionalism, with focus on rational choice, history, and sociology respectively) have also been eroded by "border crossers" who have resisted the tendencies toward cordoning these schools off from each other and who borrow liberally (and often fruitfully) where they can, in order to answer specific empirical questions.

Also, research on economic history has been made of most of the existing archives to provide insights based on quantitative methodologies. For instance, Acemoglu et al (2002) delved into the impacts of colonial institutions on GDP, using figures of European settlement, constraints in executive, and democracy in 1900 to analyze institutional differences, which will be explained later in Section II.

The next section reviews previous literature regarding the institutional influences on gender parity and the impacts of colonial institutions respectively. Section III explains the data and methodology adapted, followed by Section IV which deals with the results of the analysis. Lastly, Section V concludes and provides some points for discussion.

Section II: Literature Review

II.A: Institutional influences on gender equality

This subsection aims to review the reasons institutions have been deemed crucial for gender equality. To begin with, it is worth recognizing how disadvantageous institutions have hindered women from obtaining power, or more simply, employment. According to Goldin (2021), 'marriage bar' in the United States, namely government institutions that allowed schools and enterprises not to hire married women or dismiss women if they got married, had been an obstacle for them to build careers until this kind of 'hire bar' and 'retain bar' were abolished at the beginning of 1950s.

Institutions detrimental to women would hamper their success; likewise, ones preferable to them would reduce gender disparity. In terms of the gender wage gap, Baker et al (2023) confirmed the effectiveness of pay disclosure in narrowing the gap in Canadian universities and colleges. The difference-in-difference analysis revealed that the disclosure laws reduced gender pay disparity among university professors and staff by approximately 20-40%, and the effects were larger if institutes were early adapters of the laws due to the larger pay gap existed at the time when wage transparency was not yet introduced. Other studies also suggest similar results that pay transparency contributes to closing the gender gap in wages (Bennedsen et al, 2022), and the Salary History Ban (SHB), which prohibits employers from gaining information regarding employees' past or present wages, was effective for increasing women's salary relative to men (Hansen & McNichols, 2020).

Secondly, studies have shown that government endeavors such as the well-known conditional cash transfer (CCT) programs improved women's household bargaining power. The beneficiaries of CCT programs are those below the poverty line and strictly fulfill the conditions regarding their health and schooling of children. CCT programs are shown to bring an increase in women's income along with their bargaining power within the household, thereby reducing the risk of domestic violence against women in Uruguay (Borraz & Munyo, 2020). Their study was in line with the theory on household bargaining power and domestic violence, which suggests a reduction in violence against women in accordance with a smaller gender wage gap (e.g., Aizer, 2010). Therefore, it is reasonable to argue that institutions can be both building blocks and stumbling blocks for gender parity. The next subsection deals with literature regarding how colonial institutions have influenced current institutions.

II.B: Impacts of colonial institutions on the present

Previously the positive and negative roles of institutions are discussed. Undoubtedly, it is preferable to acquire institutions to encourage growth and equality, but we need to notice that the quality of current institutions is not independent at the time of measurement, and a careful investigation of the institutions' origins is called for. Historical influences are considered crucial for formulating current institutions, as will be discussed hereafter.

Acemoglu et al (2002) explained the difference in GDP per capita among 64 former colonies using protection against expropriation risk and postulated that the disparity in property-related institutions originated from the colonial era. When a colony was difficult for the Europeans to settle, they simply aimed to utilize the resources, so that the colony became an 'extractive state'; on the other hand, in 'settler colonies' where Europeans settled, they introduced their institutions, which were more developed concerning property rights protection. He set early settlers' mortality as an exogenous variable to estimate the existence of European settlement, thereby the impacts of colonization on early institutions. The result of his analysis was that settler colonies enjoyed higher per capita GDP even at the end of the 20th century.

Regarding the colonial influences on gender equality, there is a bunch of research from the standpoint of case studies. Here, I will summarize research on the United States (Glenn, 2015), India (Chatterjee, 1989), and Zaïre (Yates, 1982). Firstly, according to Glenn (2015), perceptions of gender were created under settler colonialism in the US. As white settlers needed to occupy the land in the New Continent and dwell, both indigenous and foreign people were deemed threatening, and especially the former group was the object of exclusion. In that process, the settlers also introduced extreme gender differentiation as they perceived it as a symbol of civilization. The result of differentiation based on both gender and race was the concept of weak white women who needed protection and subjugated women of other races who were often subjected to sexual violence. The study demonstrated how settler colonialism brought about the formation of race and gender that remains today and corresponds to Acemoglu's framework that settlers introduced their institutions that

have long-lasting effects, but different from his argument since it was in an aspect of gender and racial norms.

The example of India by Chatterjee (1989) was similar in a way considering the role of colonization in forming the inferiority of women relative to men. In the colonialist discourse, specific rituals such as widow burning were chosen in order to prove the inferiority of traditional culture, so that the settlers could justify their domination and 'civilization' of Indian people. Westerners back in the 19th century regarded Indian women as unfree and oppressed. This kind of perception did not directly form the status of women in Indian society; however, it is interesting to note that nationalism, which is on the opposing side of colonialism, also did not assume women to act independently, but rather assigned them "a place, a sign, and an objectified value". A similar 'civilizing task' also existed in the Belgian Congo, or Zaïre. Yates (1982) pointed out that women have had traditional gender roles, which had been rather diverse because of the variety in ethnic groups; while the framework of extreme Catholicism introduced to the country assigned more restricted roles to them. Colonization, thus, led to a 'double bind' of women under both traditional and colonial norms. These examples illustrated how colonization affected gender norms in different colonies through the propaganda of civilization, and implied the possibility of colonial institutions affecting gender equality in the colonized societies.

Figure 3: The possible mechanism of colonial, current institutions, and gender parity



To the best of the author's knowledge, though, current literature has not yet empirically revealed the colonial impacts on gender parity in a unified framework covering the full spectrum of former colonies. As mentioned in the previous subsection, institutions can both improve or worsen the situation for women. Also, this subsection reviewed studies regarding colonial impacts on both institutions and gender. Based on these arguments, I hypothesize the following mechanism (Figure 3).

If colonial institutions affect the quality of current institutions regarding economic activities, the question is whether such effects also exist in legal and political institutions that may affect gender parity and linger until the present day. Although colonial discourse was the main focus of the case studies mentioned above, they did not pay enough attention to institutions. For an attempt to reveal the relationship between institutions and gender parity, I set the null hypothesis (H_0) and alternative hypothesis (H_1) as follows:

 H_0 : Colonial institutions have no effects on gender equality in former colonies, because they do not affect current institutions at all.

 H_1 : Gender equality is partially attributable to colonial institutions due to its influences on current institutions.

Section III: Methodology and Data



Figure 4: Former colonies covered in this paper

Source: MapChart¹

First of all, this paper deals with two sets of analyses using both cross-sectional and panel data, in the range of 63 former colonies and their suzerains displayed in Figure 4; also, the list of countries is summarized in Appendix 1. Some former colonies such as the Philippines and (part of) China are not included in the sample, since the data on early European settlers' mortality, which will be used in the cross-sectional analysis, was not available in these countries.

It is due to constraints in the number of observations and the difficulty of observing timeseries trends in the cross-sectional data that a set of panel data between 1996 and 2022 is also analyzed. I apply two-stage least squares (2SLS) method to the former dataset, as was in Acemoglu et al (2002); for the latter set of data, I adopt fixed and random effects models, using Wu-Hausman test to clarify which method is applicable. The equations for 2SLS are (1), (2), and (3) are below:

(1) $WBL_{i} = \alpha + \beta_{1}Current institutions_{i} + \beta_{2}Parliament seats_{i} + \beta_{3}Education_{i} + \beta_{4}Religion dummy_{i} + \beta_{5}Continent dummy_{i} + \varepsilon_{i}$

(2) Current institutions_i =
$$\alpha + \gamma_1 Past$$
 institutions_i + $X_i' + \varepsilon_i$

(3) Past institutions_i = $\alpha + \tau_1 Early democracy_i + \tau_2 Settler mortality + X'_i + \varepsilon_i$

In the framework I postulate, equations (2) and (3) are the instruments for (1) and (2), respectively, and X_i denotes a vector of variables that affects both instruments. Here, the second term in equation (1) represents the scores for 'Government Effectiveness' in the World Development Indicators (hereafter WDI), as it refers to perception regarding "the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies" (World Bank, 2023). This variable ranges from approximately -2.5 to 2.5 and is standardized. According to Dejardin (2009), policies to ensure access to public resources and education, public

¹ https://www.mapchart.net/world-subdivisions.html.

health care, and pay equity are required to improve social inequalities. Implementation of these kinds of policies, along with institutions that improve gender disparity mentioned in Section II, should fall in this indicator. If this variable is statistically significant, gender equality is related to institutional quality, and phases 2 to 3 in Figure 3 will be proved.

The next term is the percentage of female members in the national parliament, followed by the gross enrolment ratio for tertiary education of females, both extracted from WDI. Having female representation in politics is thought to have positive impacts on empowering women and easing the constraints on their life chances (Kabeer, 2005). Also, the reason for considering education as a contributing factor is because I assume a potential relationship between empowerment through education and gender parity, referring to Duflo (2012). It is necessary to note that the gross enrolment rate calculated by the World Bank may exceed 100% since it divides the number of students enrolled by the population of a certain age group (World Bank, n.d.). Additionally, two dummy variables are for controlling the possible region-dependent and religion-dependent factors: Figure 2 indicated regional differences in WBL, and we might also expect disparity based on religions. For instance, Cooray and Potrafke (2010) showed that culture and religion, especially beliefs in indigenous religions and Islam were the main reasons for an unbalanced girls-to-boys enrolment ratio in primary and secondary education.

Past institutions in equation (2) is again 'Government Effectiveness' in WDI, but at an earlier stage, which is 1996. Two terms at the right-hand side of equation (3) indicate whether democratic institutions are brought into the colonies by observing democracy in the year of independence, which is taken from the Polity III dataset constructed by Jaggers and Gurr (1996), and the mortality of early European settlers taken from Acemoglu et al (2002). In the previous section, the possible route through which settler mortality affects institutions is discussed.

The equation for the panel data analysis is as follows:

(4) $WBL_{it} = \alpha + \beta_1 Governance_{it} + \beta_2 Parliament \ seats_{it} + \beta_3 Labor \ force_{it} + \beta_4 Education_{it} + \beta_5 Industrial \ structure_{it} + \beta_6 FDI_{it} + \varepsilon_{it}$

Inflows of foreign direct investment are added because some empirical studies suggest either a positive or negative relationship between FDI and gender equality (eg: Braunstein, 2006). Moreover, women's labor force participation positively affects their social position including household bargaining power, which has been constantly claimed not only by empirical analyses such as Friedberg and Webb (2006) but also by individual episodes (Kabeer, 1997). Hence, women being able to earn incomes through participating in labor and especially through working in sectors with higher wages may have stronger power within the household. Considering the WBL index also includes household aspects, these variables are supposed to be influential. Lastly, lag terms are used as instruments for explanatory variables to address reverse causality.

The following tables and figures contain additional information regarding the variables. Tables 1 and 2 respectively list the definition and summary statistics of the variables used in the crosssectional analysis, while Tables 3 and 4 are those of the panel analysis. Figure 5 shows the distribution of the WBL Index in the panel data, which is close to a normal distribution with some outliers, and Figures 6 to 8 depict the correlation and dispersion of the main variables.

Variable	Definition
wb11322	Average of the Women, Business and the Law Index between 2013 and 2022
gv_ef1322	Average of the score for "Government Effectiveness" between 2013 and 202
fparl1322	Average of the percentage of national parliament seats held by women between 2013 and 2022
ter_fe1019	Average of female gross enrolment rate of tertiary education between 2010 and 2019
africa_dummy	Takes 1 if the colony is an African country
mc_dummy	Takes 1 if the majority of population has Christian Faith
neoeu_dummy	The U.S., Canada, Austalia, New Zealand, Argentina, Uruguay=1
democlosindep	Democracy score at the year of independence, ranges from 0-10
fs_civillaw	Takes 1 if former suzerain was a civil law country
fs_lnsetmor	Log of early settler mortality
gv_ef96	Score for 'Government Effectiveness' at 1996

Table 1: List of variables in the cross-sectional analysis

Note: All the tables and figures hereafter are made by the author.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Ν	mean	sd	min	max
wbl1322	63	73.88	14.30	29.38	98.50
gv_ef1322	63	-0.233	0.873	-2.067	2.218
fparl1322	62	23.26	11.08	2.894	48.23
ter_fe1019	55	34.56	31.98	1.929	135.4
africa_dummy	63	0.444	0.501	0	1
mc_dummy	63	0.587	0.496	0	1
neoeu_dummy	63	0.0952	0.296	0	1
demclosindep	61	3.016	3.663	0	10
fs_civillaw	63	0.603	0.493	0	1
fs_lnsetmor	63	4.651	1.262	2.146	7.986
gv_ef96	63	-0.180	0.871	-1.650	1.993

Table 2: Descriptive Statistics of the cross-sectional data

Table 3: List of variables in the panel data analysis

Variable	Definition
wbl	Women, Business, and the Law Index (0~100)
gv_ef	Score of 'Government Effectiveness'
flfp	Labor force participation rate, female (% of female population ages 15+) (modeled II O estimate)
fparl	Proportion of seats held by women in national parliaments (%)
enrol_ups_fe	Gross enrolment ratio, upper secondary, female (%)
emp_srv_fe	Employment in services, female (% of female employment) (modeled ILO estimate)
fdi_in	Foreign direct investment, net inflows (% of GDP)
ge_educ_tgdp	Government expenditure on education, total (% of GDP)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Ν	mean	sd	min	max
wbl	897	67.87	16.01	26.25	97.50
gv_ef	809	-0.133	0.852	-1.735	2.232
flfp	897	50.04	15.49	11.76	84.30
fparl	825	17.42	10.15	0.615	53.08
enrol_ups_fe	897	57.14	33.99	0.948	155.9
emp_srv_fe	897	57.72	25.51	8.937	95.93
fdi_in	897	3.842	5.244	-10.61	41.53
ge_educ_tgdp	694	4.141	1.492	1.151	8.561
Number of c id	54	54	54	54	54

Table 4: Descriptive Statistics of the panel data

Figure 5: Distribution of WBL





Figure 6: WBL and government effectiveness

Figure 7: WBL and the proportion of female members in the parliament





Figure 8: WBL and labor force participation

Lastly, one thing to note is that suzerain states in this paper refer to the latest suzerains rather than the earliest settlers, as it is more natural to deem that the influence of the latest dominating power would keep influencing the dominated power rather than the earlier dominating states. Although the data for settler mortality is constructed using records between the seventeen and nineteenth centuries, a period at which the nationality of early settlers might differ from later suzerains, I assume that once the position of 'extractive state' was set, such a status would remain even if another state became the ruler afterward.

Section IV: Results

The results are divided into two subsections, as there were two distinct sets of analyses.

IV. A: Cross-sectional data

Firstly, the results of the 2SLS and ordinary least squares (OLS) method for different categorizations of countries are summarized in Table 5. Referring to equations (1) to (3) in the previous section, past institutions in 1996, the level of democracy at the year of independence, and early settler mortality are instruments for current Government Effectiveness. From the result of the Wu-Hausman test, the 2SLS method applied to the base sample and the sample without neo-Europe countries shown in the first two columns. Contrarily, in the sample consisting of African countries and non-British former colonies, the results of 2SLS were not valid. Accordingly, an OLS analysis is conducted and the results are in the last two columns.

	(1)	(2)	(3)	(4)
	2SLS	2SLS	OLS	OLS
	Pasa Samula	Without	A frican countries	Former suzerain
	Dase Sample	Neoeuropes	Affican countries	adopting civil law
Government effectiveness, average between 2013	7.251**	5.864	15.084**	-1.737
and 2022	(3.657)	(4.673)	(6.194)	(6.669)
% of parliament seats held by women, average	0.121	0.136	-0.028	0.158
between 2013 and 2022	(0.152)	(0.163)	(0.243)	(0.207)
Female gross enrolment rate of tertiary education,	-0.055	-0.051	-0.240	0.023
average between 2010 and 2019	(0.092)	(0.125)	(0.174)	(0.121)
Africa dummy	-5.137	-5.777		-15.018***
	(3.599)	(3.822)		(5.196)
Mainly Christian dummy	13.009***	12.657***	6.307	2.017
	(3.286)	(3.489)	(4.942)	(4.932)
Intercept	69.130***	68.579***	78.738***	74.554***
	(5.158)	(6.195)	(9.583)	(8.040)
R-squared	0.480	0.390	0.307	0.434
Adjusted R-squared	0.426	0.320	0.174	0.330
Number of observations	54.000	49.000	26.000	33.000

Table 5: 2SLS and OLS results

Though 2SLS was applicable, the coefficient of determination for all the columns is at a relatively lower level, which implies that the majority of differences in WBL is due to other overlooked factors. From column (2) we see that except for neo-Europes, path-dependent government effectiveness is not the main driver for higher WBL, namely legal equality of gender. In other words, for outliers such as the United States, Canada, and Australia, the impacts of colonial settlement were long-lasting, while for other countries such effects were negligible. The strong significance and large

coefficient of the Christian dummy, however, are consistent in both columns and for countries with dominant Christian beliefs, the score of WBL is better by approximately 13% than other countries. It is worth mentioning that institutions are not helpless for women in African countries, but the effectiveness of government seemed not to depend on the colonial history. In those countries, improvement in government effectiveness by 1 led to a 15% enhancement in WBL, but the difference is not driven by instruments regarding colonial institutions. Here is an incongruity between the generally accepted belief of colonial influences on institutions, pointing to a further question of how the current institutions are formed. Since this paper mainly focuses on the contributing factors of WBL, the argument regarding contributing factors of institutions will be beyond the scope, but it is probable to refer to literature on institutionalism such as Hodgson (1998). Also, the argument of Besley and Persson (2009) provides valuable insights regarding how the state capacity is formed historically. Another notable result is the insignificance of religion in Africa, contrasting the colonial discourse of civilization through technology and religion.

Dependent Variable: Government Effectiveness,	(1)	(2)	(3)	(4)
average between 2013-2022	Base sample	Without Neoeuropes	African countries	Former suzerain adopting civil law
Government Effectiveness at 1996	0.845***	0.811***	0.623***	0.676***
	(0.065)	(0.078)	(0.108)	(0.101)
Former suzerain adopting civil law (=1)	-0.102	-0.128	-0.092	
	(0.150)	(0.160)	(0.196)	
Log of early European settler mortality	-0.001	0.006	-0.007	-0.009
	(0.035)	(0.040)	(0.051)	(0.047)
Democracy at the (closest) year of (since) independence	0.003	-0.005	-0.012	0.044
	(0.020)	(0.023)	(0.027)	(0.054)
Africa dummy	-0.227**	-0.229**		-0.318**
	(0.099)	(0.104)		(0.141)
Mainly Christian dummy	-0.152	-0.166	-0.054	-0.311**
	(0.095)	(0.101)	(0.131)	(0.146)
Intercept	0.165	0.155	-0.299	0.134
-	(0.234)	(0.252)	(0.332)	(0.256)
R-squared	0.851	0.768	0.623	0.674
Adjusted R-squared	0.834	0.739	0.537	0.623
Number of observations	61	55	28	38

 Table 6: OLS results with gv
 ef1322 as dependent variable

Institutions in Africa are exogenous, but by no means free from path dependence. Based on linear regressions setting current institutions as the explained variable, past institutional quality explains more than half of the variance in the current effectiveness of government (Table 6). If the colonial impacts are ruled out, then it is necessary to find more effective instruments of past institutions and reveal the factors behind institutional quality in the past.

Combining these results from the cross-sectional analysis, it is possible to argue that colonial impacts exist especially in neo-Europe countries, but for other countries, the factors to promote gender equality lie somewhere else, which could be another reason for conducting a panel data analysis. Although not dependent on colonial history, institutions are also crucial for gender equality in African countries. What is more, religions have larger and more significant impacts on the performance of WBL in non-African countries. In countries whose suzerain adopted civil law, the effects of religion are slight, while the continent dummy becomes crucial. The reason for significance of continent dummy might be related to the fact that not many settler colonies were set in African countries. At any way, there is a need to unravel the mechanism of religious impacts on gender parity as well as the relationship between colonialism and missionary work, for instance how the prevalence of missionary work and construction of churches in the past affects current gender norms.

In the next section, we will check whether the results from a longer period will provide similar findings.

IV. B: Panel data

The results of the random effects and fixed effects model are summarized in Table 7, with controls for year-fixed effects. First and foremost, the Hausman test proved that the fixed effects model is more precise so I will adopt the results displayed in the latter two columns. The finding consistent with cross-sectional data is that 'Government Effectiveness' does not show significance in either of them. Instead, labor force participation of women and the proportion of females in the parliament were having consistent impacts on WBL; the industrial structure measured as the ratio of female workers in

the service industry is significant in the fixed effects estimation before controlling for year effects and is more valid than the educational indicator. Also, the non-significance of education is consistent with the OLS regression of the cross-sectional data, probably because of the relative prevalence of education, and the possibility that even if women are educated, they have no political representation and thus are not able to improve their social status. Concerning the insignificance of FDI, one possibility is that foreign firms and investors base their decisions on the evaluation of the current situation rather than trying to thoroughly change institutions, norms, and other gender-related factors.

	(1)	(2)	(3)	(4)
	Random effect	Random effect	Fixed effect	Fixed effect
Government effectiveness	-0.098	1.156	-1.922	-0.784
	(1.408)	(1.424)	(1.722)	(1.626)
Labor force participation (% of female ages 15+)	0.467***	0.398***	0.581***	0.432***
	(0.058)	(0.061)	(0.072)	(0.074)
Political representation (% of parliament seats held	0.471***	0.388***	0.498***	0.397***
by women)	(0.038)	(0.042)	(0.041)	(0.043)
Gross enrolment ratio of upper secondary	0.040**	-0.014	0.032	-0.037
education (female)	(0.020)	(0.023)	(0.021)	(0.023)
Employment in services (% of female employment)	0.207***	0.133**	0.129*	-0.086
	(0.055)	(0.058)	(0.073)	(0.084)
FDI inflows (% of GDP)	0.006	0.008	0.003	0.024
	(0.067)	(0.065)	(0.068)	(0.065)
Government expenditure on education (% of GDP)	0.304	0.329	0.297	0.210
-	(0.251)	(0.246)	(0.258)	(0.248)
Year dummy	No	Yes	No	Yes
Intercept	20.675***	31.238***	19.659***	43.910***
	(4.801)	(5.468)	(5.848)	(7.339)
Number of observations	463	463	463	463

Table 7: Results of random and fixed effects model

In column (4) where year effects are added to the country-fixed effects, female labor force participation and political representation remain significant, while the impacts of employment in the tertiary sector do not. Given the adjusted R2 in Within effect is around 0.583 in the FE model with a year dummy and the other two indicators of R2 are rather low, this model is optimal for interpreting the reasons behind changes in WBL within a country, rather than describing international differences.

Thence, we can deduce the insights for countries to improve gender equality. Countries may expect approximately a 1% increase in the WBL index by raising labor participation or political representation of women by 2.5%. Enabling more women to participate not only in the household but also in society will bring equality and a more comfortable society for all of us who enjoy the fruits of production and economic growth.

Before ending this paper, I will briefly summarize the main message and discuss some unresolved issues and improvements for future studies.

Section V: Conclusion and Discussion

In summary, while the effect of government effectiveness was limited, the proportion of female members in the parliament, which was not significant in the cross-sectional analysis, had sound influences on the dependent variable in the panel data analysis. The seemingly contrasting results from cross-sectional and panel analyses might be attributable to the distinct characteristics of the two types of analyses, and the selection of instruments, but the results from both sets of analyses were similar in that they revealed "other possibilities" for gender equality: it is not the far past of institutions and the colonial era, but the present of women participation in the society that counts.

Still, there are several issues regarding the data and the results of estimation. Firstly, government effectiveness may not satisfactorily represent the quality of institutions, although that was the most appropriate variable within the governance indicators, and governance and institutions are closely related (United Nations, 2015). Secondly, WBL is not able to detect women's strategic activities in society under rigid gender norms and inequality. For instance, though previous studies have shown that gender inequality in education prevails in countries with Islamic beliefs (Cooray and Potrafke, 2011), Muslimah (Muslim women) do not necessarily suffer from lower autonomy and power within their communities (Morgan et al, 2004). *Id est*, the focus of this paper is to find

underlying causes of legal and institutional inequality, but individual contexts are abstracted. Lastly, the marginal effects of women's participation in politics and the labor force remain to be revealed.

Some may argue that gender inequality is rooted in culture and religion and is not easily altered. This is true to some extent; nevertheless, research has shown that traditions and customs are alterable through policies (e.g., Bau, 2021). It is often easier to attribute what we cannot immediately deal with to a perplexing black box, but if a homo economicus compare the utility of doing so and finding solutions, she will soon realize what the dominant strategy should be. Also, to boost women's social participation, institutions are needed.

Appendix

Country	Former suzerain	Country	Former suzerain	Country	Former suzerain
Algeria	France	Ethiopia	Italy	Nicaragua	Spain
Angola	Portugal	Gabon	France	Niger	France
Argentina	Spain	Gambia	Britain	Nigeria	Britain
Australia	Britain	Ghana	Britain	Pakistan	Britain
Bahamas	Britain	Guatemala	Spain	Panama	Spain
Bangladesh	Britain	Guinea	France	Paraguay	Spain
Bolivia	Spain	Guyana	Britain	Peru	Spain
Brazil	Portugal	Haiti	France	Senegal	France
Burkina Faso	France	Honduras	Spain	Sierra Leone	Britain
Cameroon	France	Hong Kong SAR, China	Britain	Singapore	Britain
Canada	Britain	India	Britain	South Africa	Britain
Chile	Spain	Indonesia	Netherlands	Sri Lanka	Britain
Colombia	Spain	Jamaica	Britain	Sudan	Britain
Congo, Dem. Rep.	Belgium	Kenya	Britain	Tanzania	Britain
Congo, Rep.	France	Madagascar	France	Togo	France
Costa Rica	Spain	Malaysia	Britain	Trinidad and Tobago	Britain
Cote d'Ivoire	France	Mali	France	Tunisia	France
Dominican Republic	Spain	Malta	Britain	Uganda	Britain
Ecuador	Spain	Mexico	Spain	United States	Britain
Egypt, Arab Rep.	Britain	Morocco	France	Uruguay	Spain
El Salvador	Spain	New Zealand	Britain	Vietnam	France

Appendix 1: List of 63 former colonies analyzed in this study (with former suzerain)

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