2-26-2018

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Recommended Citation

Hazarika, Gautam. "The Plough, Gender Roles, and Corruption." Economics of Governance 19, no. 2 (February 26, 2018): 141–63. https://doi.org/10.1007/s10101-018-0202-7.

The Plough, Gender Roles, and Corruption

1. Introduction

Cross-national empirical studies of corruption commonly find significant correlation between indices of corruption and women's participation in the labour force and politics. Nations in which women play a greater role in economic and public life are found to suffer less corruption. A causal relationship, that the greater participation of women in the labor force and politics reduces national corruption, has been inferred. This has been controversial in that, first, it is possible unobserved aspects of national institutions and attitudes affect both corruption and women's participation in the labor force and politics, so that the observed correlation between gender and corruption is spurious, and, second, that corruption may obstruct women's participation in the labor force and politics, so that there is reverse causality. Instrumental variables estimation might have settled the controversy but for the difficulty of finding credible instruments. This paper argues that a potential instrument may be found in historical geography. A recent study by Alesina, Giuliano, and Nunn (2013) uncovers support for Boserup's (1970) hypothesis that the ancient adoption of the plow, a heavy implement better suited to use by men, led to a gendered division of labor by which women made their economic contributions from home, and that this gave rise to persistent cultural norms prescribing domesticity in women. Alesina, Giuliano, and Nunn (2013) discover that countries in which a greater proportion of the population traces its ancestry to ethnic groups who adopted the plow continue to see lower women's participation in the labor force and politics. This suggests that the geographical suitability of national ancestral lands to crops benefited by the use of the plow, is a potential instrument for women's participation in economic and public life. Its use, it is demonstrated, yields a much weaker and statistically insignificant relationship between gender and corruption. The paper concludes that ordinary least squares estimates of the coefficients of

regressors measuring women's economic and political influence, in regressions in which measured corruption is the dependent variable, are substantially biased.

Swamy's, Knack's, Lee's, and Azfar's (2001) pioneering study of gender and corruption made the striking discovery that countries in which women make up larger shares of parliament, ministers, and the labour force are perceived to suffer less corruption. This was closely followed by Dollar's, Fisman's, and Gatti's (2001) finding that perceived national corruption is negatively related to the proportion of parliamentary seats held by women. Whereas Swamy et al. (2001) were agnostic as to the reasons for correlation between gender and corruption, Dollar et al. (2001) suggested women are intrinsically more trustworthy and public-spirited than men. As shall be discussed, this has proven a contentious thesis. This nascent literature was then agitated by a dissenting opinion. Sung (2003) argued that the hitherto observed correlation between gender and corruption was spurious in being caused by correlation between a third factor, namely, liberal democracy, and each of gender and corruption. While Swamy et al. (2001) controlled for national political freedoms and Dollar et al. (2001) for civil liberties, these measured liberal democracy inadequately, contended Sung (2003). In other words, the regression errors in the analyses by Swamy et al. (2001) and Dollar et al. (2001) included unmeasured aspects of liberal democracy correlated with women's empowerment, leading to bias in ordinary least squares (OLS) estimates of the effects of gender upon corruption. Sung demonstrated that once liberal democracy is extensively controlled for, women's representation in ministerial cabinets, sub-ministerial officialdom, and parliament are reduced to statistically insignificant correlates of corruption.

Correlation between the regression error and measures of women's participation in the labour force and politics may also result from reverse causality. Bjarnegard (2013) argues that corruption within political parties, consisting of 'clientelism', the exchange of personal favours for political support, is an impediment to women's participation in politics. Such corruption relies on

networks, access to which requires a type of social capital, termed 'homosocial' capital, built on relationships between men. It is naturally difficult for female political aspirants to break into these masculine networks. Also, as noted by Frank, Lambsdorff, and Boehm (2011), corruption may hamper legal institutions' ability to protect women against discrimination in the labour market and politics.

There are two approaches to addressing correlation between the error term and measures of women's participation in economic and public life in a regression in which a gauge of national corruption is the dependent variable. If the endogeneity is due to inclusion in the regression error of unobserved aspects of national institutions and attitudes correlated with women's influence in the economy and politics, these aspects might be treated as country fixed-effects provided a time series of data were available. This is the tactic of Debski and Jetter (2015). The authors consider values of Transparency International's Corruption Perception Index for the years 1998-2011 to constitute a time series. By their country fixed effects model, greater participation by women in economic and public life is *not* associated with perceptions of less corruption. This finding might have been a valuable contribution to the literature but for the authors' error in considering values of the Corruption Perception Index to be intertemporally comparable. Transparency International warns that "CPI scores before 2012 are not comparable across time" [1]. Intertemporal incomparability is a weakness as well of the World Bank's Control of Corruption Index. Further, even if suitable time series data were available, fixed effects estimation wouldn't be a solution to the problem of reverse causality.

Instrumental variables (IV) estimation is the other approach to addressing the potential endogeneity of measures of women's influence in the economy and politics. A valid instrument must be uncorrelated with unobserved influences upon corruption. It must also be correlated with women's participation in economic and public life, and it mustn't itself be a direct influence upon

corruption. There is to date only one published account, by Chen (2013), of IV estimation of the effects of gender upon corruption. There are, broadly, two parliamentary electoral systems in the world's democracies: majoritarian representation and proportional representation. In the majoritarian system, there is only one parliamentary seat per district. Hence, each political party fields but one candidate per district, and the candidate who wins the most votes is elected to parliament. On the other hand, there are multiple parliamentary seats per district in the proportional system. The proportion of these that a party wins is equal to the share of total votes cast in its favour. For example, a party winning 40% of total votes in a 10-seat district will have gained 4 of these 10 seats. Chen (2013) argues that political parties are likelier to field female candidates when the system of representation is proportional. She reasons that, first, political parties, long dominated by men, will tend to field male candidates when electoral rules permit but one candidate per district, and, second, that parties are likelier to include women in their field of candidates in multi-seat districts in order to better attract female voters. Chen (2013) demonstrates that the proportion of women in parliament is significantly lower in democracies with majoritarian representation. She proceeds to use an indicator of this form of representation, together with an indicator of the institution of gender quotas in democracies with proportional representation, as instruments for the share of parliamentary seats held by women in a regression in which Transparency International's Corruption Perception Index is the dependent variable. This strategy yields the finding that women's participation in politics significantly reduces corruption. However, the validity of Chen's (2013) identifying instruments is questionable. Proportional representation was devised as a solution to the particular weakness of the majoritarian system that it is possible for the victor in a multi-party race to have won a minority of the vote, that is, possible for parliament to be unrepresentative of the full diversity of national political opinion. It might be argued that a nation that recognises this shortcoming and acts to remedy it by adopting proportional representation likely possesses

progressive institutions and attitudes intolerant of corruption. After all, proportional representation is the dominant electoral system of the liberal democracies of Western Europe famed for their good governance. In other words, an indicator of majoritarian representation may be correlated with the regression error.

This study too employs IV estimation to address the potential endogeneity of measures of women's participation in economic and public life, but its choice of instrument, based on nations' ancestral geography, is more readily defended. Whereas a country's electoral system is chosen by its polity, there is arguably little that is volitional about its ancestral geography, so that the likelihood of correlation between it and unobserved aspects of national institutions and attitudes with bearing on corruption, is remote. The particular feature of ancestral geography made use of is the suitability of nations' ancestral lands to crops benefited by the use of the plough, that is, 'plough-positive' crops in Pryor's (1985) parlance. Boserup (1970) proposed that the adoption of the plough in antiquity may have given rise to cultural norms prescribing domesticity in women that persist to this day. The plough, a heavy implement drawn by powerful draft animals difficult to control, is better suited to use by men. So its adoption may have led to a gendered division of labour by which women made their economic contributions from home. Perhaps it gradually came to be believed that women's proper place was the home. Indeed, Alesina, Giuliano, and Nunn (2013) find that there is less female labour force participation, women's ownership of businesses, and women's representation in parliament in countries in which a greater proportion of the population traces its ancestry to ethnic groups that took up the plough. Since the plough was likelier to have been adopted in regions better suited to 'plough-positive' crops, it is likely that women's participation in economic and public life is correlated with the suitability of nations' ancestral lands to such crops. In other words, not only is this feature of ancestral geography likely exogenous, it is also likely correlated with women's

representation in the labour force and politics. This study finds that its use as an instrument turns the estimated relationship between gender and corruption statistically insignificant.

The remainder of the paper is organised as follows. Since problematic explanations may be symptomatic of suspect findings, section 2 critiques existing explanations of statistically significant correlation between gender and corruption in cross-national OLS regressions. Section 3 explains Boserup's (1970) thesis of a connection between the ancient adoption of the plough and modern gender roles, and describes its testing by Alesina, Giuliano, and Nunn (2013), with a view to establishing the plausibility of this study's choice of instrument. Section 4 describes the data and presents estimates, both OLS and IV, of the effects of gender upon corruption towards demonstrating that OLS estimates are substantially biased. Section 5 summarises the study's findings and presents its conclusions.

2. Gender and Corruption: Problematic Explanations

Commonly sizeable and significant OLS estimates of the effects of gender upon corruption have led researchers to conclude that women are either morally superior to men, more averse to the risk of being caught, or less endowed with opportunities for corruption. Of these explanations, the first has inspired conspicuous policy initiatives in parts of the world. For example, units of the traffic police forces of Lima and Mexico City and the customs service of Mexico have been feminised. The view that the induction of women into officialdom shall reduce corruption because of women's moral superiority is, incidentally, the reverse of older views of feminine morality. For instance, both Plato and Aristotle held that women, since they were considered ruled by emotion, were morally inferior to men[2]. This view was shared by Eastern philosophers as well, such as the ancient Indian statesman-philosopher Kautilya[3]. Goetz (2007) drily notes that "the very traits that branded women as deficient in moral development, their concern to help and to please, are now seen as functional

for good governance reforms in developing and transitional societies". In other words, traits ascribed to women once viewed as making for moral weakness are now seen as cornerstones of moral strength, that is, the definition of morality has changed. It may make little sense to consider women morally superior if notions of morality are mutable. Perhaps it is more useful to speak of honesty than morality. Are women more honest than men?

Crime statistics supply a partial answer. By the US Federal Bureau of Investigation's crime statistics, women made up only 26.54% of all arrests in 2013[4]. Men dominated all categories of crime save 'prostitution and commercialized vice'. Men overwhelmingly dominated violent crime, but this may not be informative of gender differences in honesty since men may be more socialised, even hormonally predisposed, to violence. What of gender differences in arrests for non-violent crimes? While more men than women were arrested for non-violent crimes as well in 2013, the gender gaps were perhaps tellingly small in some categories. For example, women made up 39.9% of arrests for 'fraud', 43.1% of arrests for 'larceny-theft', and 48.4% of arrests for 'embezzlement'. It has been argued that crime isn't merely the outcome of the perpetrators' proclivities to dishonesty. There must be opportunity as well, and women may have fewer criminal opportunities than men, so that it is possible women shall be as likely as men to commit non-violent crime when there is no gender gap in opportunity. Perhaps this is why women made up virtually half of all arrests for embezzlement. As writes Dodge (2013), "the high number of women embezzlers is attributed to workplace opportunities that involve low-level occupations such as bookkeepers, bank tellers, or secretaries who have access to company funds". In sum, crime statistics don't strongly point to women's greater honesty.

Besides, social science experiments on honesty have been inconclusive. Frank's, Lambsdorff's, and Boehm's (2011) survey of laboratory experiments on gender and corruption infers that "women are not necessarily more intrinsically honest or averse to corruption than men".

A similar survey by Chaudhuri (2012) finds that "the evidence for greater incorruptibility on the part of women comes primarily from developed nations" with no "strong differences in developing countries where the problem of corruption is far more endemic". There is traditional empirical evidence as well of the lack of a gender difference in corruptibility in the developing world. For example, Vijaylakshmi (2007) finds "no significant gender difference in attitudes towards rent-seeking or in actual levels of corruption between male and female representatives" in Indian local government. Since it may not then be asserted that women are universally more honest than men, significant correlation between gender and corruption in cross-national OLS regressions must be explained by either women's greater risk aversion or their relatively fewer opportunities for corruption. These explanations are problematic as well in that they don't inspire meaningful policy.

Laboratory experiments on corruption have tended to find that women are significantly less inclined to dishonesty than men when there is risk of discovery and penalty (e.g., Schulze and Frank, 2003). Indeed, Croson's and Gneezy's (2009) survey of research upon gender differences in preferences concludes that "men are more risk-taking than women in most tasks and most populations". If women are less prone to dishonesty than men only when there is risk of discovery and punishment, the recruitment of women into officialdom in corruption-wracked developing countries, where such risk is presumably low, is unlikely to improve governance. The explanation that women have less opportunity for corruption too doesn't make for effectual policy since, as noted by Goetz (2007), more women in officialdom may well expand women's opportunities for corruption by facilitating the formation of all-female networks of corruption or the subjugation of male-dominated networks by female leaders.

In sum, statistically significant correlation between gender and corruption in cross-national analyses that ignore the potential endogeneity of women's influence in the economy and politics has elicited problematic explanations. The explanation that women are inherently more honest than men

isn't unambiguously supported by non-violent crime statistics, social science experiments, or survey-based empirical analyses. On the other hand, while the explanations that women are more risk-averse than men, or relatively lacking in opportunity for corruption, are plausible, they don't make for effective policy solutions to the scourge of corruption in developing and transitional economies.

3. The Plough and Gender Roles

The Danish agricultural economist Esther Boserup, renowned for her pioneering work on gender and development, believed there was a link between agriculture by the mean of the plough and cultural norms governing gender roles. Her observations of rural life in the developing world led her to note that regions home to plough agriculture "show a predominantly male family labour force, because a large proportion of women in the cultivator families are completely exempted from work in the fields. The land is prepared for sowing by men using draught animals, and this thorough land preparation leaves little need for weeding the crop, which is usually the women's task. Therefore women contribute mainly to harvest work and to the care of domestic animals. Because village women work less in agriculture, a considerable proportion of them are completely freed from farm work. Sometimes such women perform only domestic duties, living in seclusion within their own homes, and appearing in the village street only under the protection of the veil, a phenomenon associated with plough culture, and seemingly unknown in regions of shifting cultivation where women do most of the agricultural toil" (Boserup, 1970). The plough may have led to the masculinisation of agriculture for at least three reasons. First, it is a heavy implement drawn by powerful animals difficult to control. Second, since it severs the roots of weeds, its use greatly reduces the need for weeding, traditionally in the realm of women, and, third, since small children in the vicinity of its operation may be injured by it, and ploughing may not be frequently and unexpectedly interrupted, the plough isn't suited to use by persons whose other responsibility is

childcare. Boserup theorised that, since the plough's masculinisation of agriculture must have held as well in antiquity, plough cultures eventually developed beliefs that women's proper place was the home, that is, norms prescribing a domestic role for women in society. This thesis has lately been tested by Alesina, Giuliano, and Nunn (2013), who find that, even once contemporary economic conditions are controlled for, women's participation in the labour force, entrepreneurship, and politics is lower in countries in which a larger fraction of the population is descended from ethnic groups who adopted the plough, and that this pattern even survives emigration in that there is less labour force participation among the daughters of migrants to the US and Europe from countries in which the ancestral use of the plough was more widespread.

It is naturally likely that the plough was first adopted in areas ecologically suited to its use. Pryor (1985) distinguishes between 'plough-positive' and 'plough-negative' crops. The former, whose cultivation is greatly benefited by the use of the plough, are crops, such as wheat, barley, rye, and buckwheat, requiring large tracts of land to be rapidly prepared for sowing and soils that aren't shallow, sloped, or rocky. The latter include such crops as millet and sorghum, whose seeds don't need to be buried in furrows or deep holes, and corn, which is so calorie-rich that sufficient calories for subsistence are yielded by a relatively small plot of land. Pryor observes that 'plough-positive' or 'plough-negative' crops may be ecologically impossible to grow in parts of the world. In other words, there is spatial heterogeneity in ecological suitability to crops benefited by the plough.

Alesina, Giuliano, and Nunn (2013) develop a measure of the ecological suitability of a nation's ancestral lands to 'plough-positive' crops. First, they identify the various ethnic groups comprising the nation. They then procure the geographical coordinates of these groups' ethnic centroids, the places whence they originated, from Murdock's *Ethnographic Atlas*, a global database of 1,265 ethnic groups. Alesina, Giuliano, and Nunn consider land within 200 kilometers of each such centroid the concerned ethnic group's ancestral land. They use the UN Food and Agricultural

Organization's (FAO) *Global Agro-Ecological Zones* 2002 database to calculate the share of each ethnic group's ancestral land suited to the cultivation of 'plough-positive' crops. Finally, they calculate the share of the *nation's* ancestral lands suited to 'plough-positive' crops as the weighted mean of the shares of its constituent ethnic groups' ancestral lands suited to such crops, the weights being these groups' shares in the national population.

The use of this variable as an instrument has recent precedent. Alesina, Giuliano, and Nunn (2013), concerned that their finding of a cross-national negative relationship between historical plough agriculture and women's current participation in the labour force, entrepreneurship, and politics is driven by unobserved heterogeneity, employ the variable as an instrument for the actual historical use of the plough. As argued, the variable is a potential instrument as well for women's participation in economic and pubic life in cross-national regressions in which a gauge of corruption is the dependent variable. After all, ancestral geography is likely a historical accident. On the other hand the suitability to 'plough-positive' crops, hence the actual historical use of the plough, may have led to more rapid economic and political development conducive to the rise of progressive institutions and attitudes hostile to corruption, but it is possible to mitigate this difficulty by controlling for both current and ancestral economic and political development.

4. Data and Empirical Findings

Table 1 presents the sample mean values of all the variable utilised in the analysis. National corruption is measured by the World Bank's Control of Corruption Index (CCI) for 2013. It gauges "perceptions of the extent to which pubic power is exercised for private gain, including petty and grand forms of corruption, as well as "capture" of the state by elites and private interests". Nations with higher values of this indicator are perceived to be less corrupt. The CCI has been a common measure of national corruption in empirical work. Women's participation in economic life is

measured by the national female labour force participation rate, defined as the percentage of the female population aged at least 15 in the labour force. Women's participation in public life is measured in two ways: the percentage of ministerial level positions held by women in 2012, and the percentage of parliamentary seats held by women in 2013. As discussed, the study's identifying instrument is the percentage of national ancestral lands suited to 'plough-positive' crops, that is, crops benefited by the use of the plough. The other variables employed in the analysis are largely identical, or akin, to the correlates of corruption discussed by Treisman (2007). For example, since corruption may be linked to the size of economic rents appropriable by bureaucrats and politicians, the analysis controls for the share of natural resources rents in GDP, as well as the share of international trade in GDP since trade-led competition shrinks monopoly rents. Similarly, since it has been hypothesised that corruption in many developing nations today is a legacy of venal extractive forms of colonialism, dummy variables describing historical colonial status are included in the analysis, as is the share of the population descended from Europeans since European settlement in former colonies was typically accompanied by the founding of beneficent institutions.

In order to minimise the possibility of correlation between this instrument and unobserved progressive institutions and attitudes arising from the perhaps more rapid economic and political development generated by the use of the plough, measures of both current and ancestral economic and political development are included in the analysis. Current levels of economic and political development are measured, respectively, by per capita income and the Polity democracy score. Ancestral economic and political development are controlled for as follows. An ethnic group's level of ancestral economic development is measured by an index of its historical settlement pattern taken from Murdock's *Ethnographic Atlas*. It ranges in value from 1 to 8, with 1 representing a fully nomadic existence and 8 complex settlement. For each nation, Alesina, Giuliano, and Nunn (2013) calculate the weighted average of the values of this index pertaining to its constituent ethnicities, the

weights being the population shares of these ethnicities. In like fashion, an ethnic group's level of ancestral political development is gauged by an index of its levels of political hierarchy. This index, also taken from the *Ethnographic Atlas*, ranges in value from 1 to 5, with 1 indicating no jurisdictional hierarchies beyond the local community and 5 indicating four levels of such hierarchies. For each nation, Alesina, Giuliano, and Nunn (2013) similarly compute the weighted average of the values of this index pertaining to its constituent ethnicities.

Table 2 presents baseline OLS estimates of the determinants of corruption. These are indicative of a statistically significant connection between gender and corruption across countries: those in which more women participate in the labour force and a greater share of ministerial level positions and parliamentary seats are held by women are perceived to be less corrupt. Table 3 presents OLS estimates relating to the baseline regression equations augmented to include a variety of historical controls of which the aforementioned measures of nations' ancestral levels of economic and political development are a part. Once again, the potentially erroneous treatment of the regressors gauging women's representation in the labour force and politics as exogenous yields a statistically significant positive relationship between each and the CCI. Next, variables gauging contemporary economic conditions are added as regressors. The ensuing estimates, presented in table 4, too indicate that the ignoring of the potential endogeneity of women's participation in economic and public life results in a statistically significant association between gender and corruption. Table 5 presents OLS estimates pertaining to the regression equations thus far augmented to include a selection of socio-cultural controls. As before, the treatment as exogenous of women's participation in the labour force and their representation in ministerial cabinets results in their statistical significance. However, it appears that controlling for the fraction of Protestants in the population turns women's representation in parliament statistically insignificant. This is probably because the Protestant nations of Northern Europe are characterised by both very low levels of

corruption (high values of the CCI) and high women's representation in parliament. It is notable that neither Swamy et al. (2001) nor Dollar et al. (2001) control for the extent of Protestantism. Weber (1930) famously wrote of a 'Protestant Ethic' whose hallmark was worldly asceticism. Indeed, Weber describes Protestants as having abolished the Catholic monasteries only to turn the world into one. It is likely that this way of life was inimical to corruption. Further, as described by Berger (2010), Pentecostal Protestants in Latin America seem to have fostered a culture less sexist than that of their Catholic compatriots. In other words, Protestantism may be associated with more egalitarian gender norms. Hence, the omission of this control by Swamy et al. (2001) and Dollar et al. (2001) may have led to their overestimation of the effect of women's parliamentary representation upon measured corruption. In sum, once socio-cultural factors are extensively controlled for, only the female labour force participation rate and the percentage of ministerial level positions held by women, treated as exogenous, remain statistically significant correlates of perceived corruption. This study shall next explore the robustness of these two variables' statistical significance to IV estimation.

In keeping with Boserup's (1970) hypothesis, the estimates in table 6 indicate that ancestral geographical suitability to crops benefited by the use of the plough is significantly negatively associated with women's representation in the labour force and politics. Hence, not only is ancestral geography likely exogenous, it is also strongly correlated with these potentially endogenous measures of women's economic and political influence. Table 7 presents two-stage least squares (2SLS) estimates, analogous to the OLS estimates in columns (1) and (2) of table 5, the identifying instrument being nations' ancestral suitability to 'plough-positive' crops. By these, neither women's participation in the labour force nor their representation in ministerial cabinets is a significant correlate of perceived corruption. Note that the 2SLS point estimates of these regressors are, respectively, 89% and 91% smaller than their OLS counterparts. It is concluded that OLS estimates

of the effects of gender upon corruption are substantially biased. These IV estimates also indicate that there is significantly less corruption in countries with greater per capita incomes, and, curiously, more corruption in countries whose adult populations are more educated. Perhaps its lack of emphasis upon ethics is a weakness of modern education. Corruption is perceived to be significantly lower in more open economies, and higher in nations more ethnically fractionalised. Finally, both Christianity and Islam appear associated with less corruption.

5. Conclusion

The principal contribution of this paper to the body of research upon gender and corruption is its treatment of women's participation in economic and public life as endogenous. As argued, such endogeneity may be the result of unobserved influences upon corruption being factors also in women's representation in the labour force and politics, or the consequence of reverse causality, that is, the effect of corruption upon women's ease of entry into the labour force or politics. Previous attempts to address this endogeneity, OLS with country fixed-effects (Debski and Jetter, 2015) and instrumental variables estimation (Chen, 2013), have not been convincing. On the other hand, this study's use of ancestral geography, arguably a historical accident, as the identifying instrument in IV estimation of the effects of gender upon corruption is a plausible strategy. The ensuing estimates indicate that gender is a statistically insignificant correlate of corruption. Hence, this study's findings are not supportive of policy initiatives to increase women's influence in economic and public life toward combatting corruption. While such initiatives remain valuable, their value may lie in their promotion of equity, not efficiency.

Table 1
Sample Means

Variable	**Obs.**	**Mean**	**S.D.**
The World Bank's Control of Corruption Indicator for 2013 (negatively related to perceived corruption)	207	-0.008	0.998
female labour force participation rate in 2013 (%) – The World Bank	186	52.766	16.060
percentage of ministerial level positions held by women in 2012 – The World Bank	184	17.180	11.917
percentage of parliamentary seats held by women 2013 – The World Bank	187	19.728	11.684
percentage of national ancestral lands suited to 'plough-positive' crops – Alesina, Giuliano, and Nunn (2013)	203	0.485	0.414
log of per capita gross national income PPP in 2013 – The World Bank	188	8.666	1.464
average years of schooling in 2010 of those 15 or older - Barro and Lee (2013)	146	8.347	2.810
Polity2 index of democracy in 2013 – Center for Systemic Peace	165	4.188	6.159
former British colony	194	0.327	0.469
former French colony	196	0.153	0.401
never colonised	195	0.144	0.352
formerly (or currently) a communist country	241	0.216	0.412
proportion of national ancestral lands suited to agriculture – Alesina, Giuliano, and Nunn (2013)	215	54.189	33.387
ancestral political development (index of hierarchical levels) – Alesina, Giuliano, and Nunn (2013)	228	3.304	1.040
ancestral economic development (index of settlement patterns) – Alesina, Giuliano, and Nunn (2013)	228	6.380	1.381
natural resources rents as a percentage of GDP in 2013 – The World Bank	180	10.531	13.383
international trade as a percentage of GDP in 2013 – The World Bank	176	95.003	54.272
value added in agriculture as a percentage of GDP in 2013 – The World Bank	164	12.942	12.247
value added in industry as a percentage of GDP in 2013 – The World Bank	164	28.220	13.727
percentage of national land area that is potentially arable - FAO	161	42.724	27.591
measure of national ethnic fractionalisation – Alesina, Devleeschauwer, and Easterly (2003)	189	0.441	0.258
percentage of the population of European descent – Nunn and Puga (2012)	169	32.201	41.715
percentage of Catholics in the population – McCleary and Barro (2006)	189	0.289	0.332
percentage of Protestants in the population – McCleary and Barro (2006)	189	0.139	0.209
percentage of other Christian sects in the population – McCleary and Barro (2006)	189	0.085	0.112
percentage of Muslims in the population – McCleary and Barro (2006)	189	0.233	0.346
percentage of Hindus in the population – McCleary and Barro (2006)	189	0.022	0.095
continent = Asia	240	0.221	0.416
continent = Europe	240	0.208	0.407
continent = North America	240	0.163	0.370
continent = Oceania	240	0.108	0.311
continent = South America	240	0.063	0.243

Table 2
Gender and Corruption: Cross-Country Estimates –
Baseline Controls
Dependent Variable = The World Bank's Control of Corruption Indicator for 2013

Variable	OLS Coefficient Estimates		
	(1)	(2)	(3)
Constant	-6.056***	-5.046***	-5.175***
	(0.435)	(0.319)	(0.369)
Key Regressors			
female labour force participation rate in 2013 (%)	**0.014*** **		
- The World Bank	**(0.004)**		
percentage ministerial level positions held by women in 2012		**0.022*** **	
- The World Bank		**(0.005)**	
percentage parliamentary seats held by women in 2013			**0.014** **
- The World Bank			**(0.006)**
Baseline Controls			
log of per capita gross national income PPP in 2013	0.666***	0.570***	0.603***
- The World Bank	(0.057)	(0.057)	(0.059)
average years of schooling in 2010 of those 15 or older	-0.061*	-0.041	-0.043
- Barro and Lee (2013)	(0.032)	(0.029)	(0.031)
Polity2 index of democracy in 2013	0.034***	0.030***	0.034***
- Center for Systemic Peace	(0.010)	(0.010)	(0.011)
Continent dummy variables	Yes	Yes	Yes
Adjusted R-squared	0.71	0.72	0.69
N	131	127	127

Notes: robust standard errors in parentheses; * significant at 10%, ** significant at 5%, *** significant at 1%

Table 3
Gender and Corruption: Cross-Country Estimates –
Baseline & Historical Controls
Dependent Variable = The World Bank's Control of Corruption Indicator for 2013

Variable	OLS Coefficient Estimates		
	(1)	(2)	(3)
Constant	-6.175***	-5.591***	-5.830***
	(0.530)	(0.484)	(0.505)
Key Regressors			
percentage ministerial level positions held by women in 2012 - The World Bank	**0.013*** **		
	(0.004)		
percentage parliamentary seats held by women in 2013 - The World Bank		**0.021*** **	
		(0.005)	
percentage of women in parliament 2013 - The World Bank			**0.017** **
			(0.006)
Historical Controls			
former British colony	0.190	0.095	0.158
	(0.169)	(0.183)	(0.173)
former French colony	0.176	0.161	0.095
	(0.173)	(0.189)	(0.187)
never colonised	0.081	-0.008	0.099
	(0.217)	(0.198)	(0.206)
formerly (or currently) a communist country	-0.192	-0.099	-0.074
	(0.181)	(0.166)	(0.151)
proportion of national ancestral lands suited to agriculture - Alesina, Giuliano, and Nunn (2013)	0.002	0.004*	0.004*
	(0.002)	(0.002)	(0.002)
ancestral political development (index of hierarchical levels) - Alesina, Giuliano, and Nunn (2013)	-0.010	-0.054	-0.071
	(0.079)	(0.074)	(0.073)
ancestral economic development (index of settlement patterns) - Alesina, Giuliano, and Nunn (2013)	0.047	0.084**	0.111**
	(0.041)	(0.041)	(0.043)
Baseline Controls	Yes	Yes	Yes
Adjusted R-squared	0.71	0.73	0.71
N	128	124	124

Notes: robust standard errors in parentheses; * significant at 10%, ** significant at 5%, *** significant at 1%

Table 4
Gender and Corruption: Cross-Country Estimates –
Baseline, Historical, & Contemporary Economic Controls
Dependent Variable = The World Bank's Control of Corruption Indicator for 2013

Variable	OLS Coefficient Estimates		
	(1)	(2)	(3)
Constant	-5.764***	-6.133***	-5.942***
	(0.854)	(0.836)	(0.913)
Key Regressors			
female labour force participation rate in 2013 (%)	**0.013*** **		
- The World Bank	**(0.004)**		
percentage ministerial level positions held by women in 2012		**0.019*** **	
- The World Bank		**(0.005)**	
percentage parliamentary seats held by women in 2013			**0.012** **
- The World Bank			**(0.006)**
Contemporary Economic Controls			
natural resources rents as a percentage of GDP in 2013	-0.012*	-0.014**	-0.007
- The World Bank	(0.007)	(0.007)	(0.007)
international trade as a percentage of GDP in 2013	0.003**	0.003***	0.004***
- The World Bank	(0.001)	(0.001)	(0.001)
value added in agriculture as a percentage of GDP in 2013	0.005	0.015*	0.011
- The World Bank	(0.010)	(0.009)	(0.011)
value added in industry as a percentage of GDP in 2013	-0.012	-0.005	-0.012
- The World Bank	(0.009)	(0.009)	(0.009)
percentage of national land area that is potentially arable	-0.004	-0.001	-0.003
- FAO	(0.003)	(0.003)	(0.003)
Baseline Controls	Yes	Yes	Yes
Historical Controls	Yes	Yes	Yes
Adjusted R-squared	0.78	0.79	0.77
N	108	105	104

Notes: robust standard errors in parentheses; * significant at 10%, ** significant at 5%, *** significant at 1%

Table 5
Gender and Corruption: Cross-Country Estimates –
Baseline, Historical, Contemporary Economic, & Socio-Cultural Controls
Dependent Variable = The World Bank's Control of Corruption Indicator for 2013

Variable	OLS Coefficient Estimates		
	(1)	(2)	(3)
Constant	-6.433***	-6.128***	-5.380***
	(0.962)	(0.985)	(1.115)
Key Regressors			
female labour force participation rate in 2013 (%)	**0.018*** **		
- The World Bank	**(0.005)**		
percentage ministerial level positions held by women in 2012		**0.016*** **	
- The World Bank		**(0.006)**	
percentage parliamentary seats held by women in 2013			**0.003**
- The World Bank			**(0.006)**
Socio-Cultural Controls			
measure of national ethnic fractionalisation	-0.601**	-0.631***	-0.547**
- Alesina, Devleeschauwer, and Easterly (2003)	(0.228)	(0.225)	(0.252)
percentage of the population of European descent	-0.002	-0.001	-0.003
- Nunn and Puga (2012)	(0.004)	(0.005)	(0.005)
percentage of Catholics in the population	0.383	0.227	0.292
- McCleary and Barro (2006)	(0.233)	(0.251)	(0.265)
percentage of Protestants in the population	**1.286*** **	**0.918*** **	**1.390*** **
- McCleary and Barro (2006)	**(0.306)**	**(0.346)**	**(0.361)**
percentage of other Christian sects in the population	0.948*	0.937*	0.585
- McCleary and Barro (2006)	(0.560)	(0.542)	(0.678)
percentage of Muslims in the population	0.986***	0.490**	0.398
- McCleary and Barro (2006)	(0.288)	(0.238)	(0.255)
percentage of Hindus in the population	0.961*	0.492	0.575
- McCleary and Barro (2006)	(0.530)	(0.366)	(0.388)
Baseline Controls	Yes	Yes	Yes
Historical Controls	Yes	Yes	Yes
Contemporary Economic Controls	Yes	Yes	Yes
Adjusted R-squared	0.82	0.81	0.80
N	108	105	104

Notes: robust standard errors in parentheses; * significant at 10%, ** significant at 5%, *** significant at 1%

Table 6
Women and the Plough

Variable	Dependent Variable	
	female labour force participation rate	% of women in ministerial level positions
	OLS Coefficient Estimates	
Constant	36.748*	12.862
	(20.207)	(19.987)
Identifying Instrument		
percentage of national ancestral lands suited to 'plough-positive' crops - Alesina, Giuliano, and Nunn (2013)	**-16.682*** **	**-14.786*** **
	(5.112)	**(4.905)**
Baseline Controls	Yes	Yes
Historical Controls	Yes	Yes
Contemporary Economic Controls	Yes	Yes
Socio-Cultural Controls	Yes	Yes
Adjusted R-squared	0.63	0.48
N	108	105

Notes: robust standard errors in parentheses; * significant at 10%, ** significant at 5%, *** significant at 1%

Table 7
Gender and Corruption: Cross-Country IV Estimates –
Baseline, Historical, Contemporary Economic, & Socio-Cultural Controls
Dependent Variable = The World Bank's Control of Corruption Indicator for 2013

Variable	2SLS Coeff. Ests.	
Constant	-6.141***	-5.996***
	(0.866)	(0.825)
Key Regressors		
female labour force participation rate in 2013 (%) - The World Bank	**0.011**	
	(0.013)	
percentage of ministerial level positions held by women in 2012		**0.009**
- The World Bank		**(0.014)**
Baseline Controls		
log of per capita gross national income PPP in 2013	0.716***	0.721***
- The World Bank	(0.081)	(0.083)
average years of schooling in 2010 of those 15 or older	-0.065**	-0.072**
- Barro and Lee (2013)	(0.030)	(0.028)
Polity2 index of democracy in 2013	0.019*	0.012
- Center for Systemic Peace	(0.010)	(0.012)
Continent dummy variables	Yes	Yes
Historical Controls		
former British colony	-0.071	-0.046
	(0.134)	(0.143)
former French colony	-0.064	-0.040
	(0.149)	(0.160)
never colonised	0.022	0.033
	(0.142)	(0.150)
formerly (or currently) a communist country	0.133	0.141
	(0.147)	(0.145)
proportion of national ancestral lands suited to	-0.003	-0.000
agriculture - Alesina, Giuliano, and Nunn (2013)	(0.004)	(0.002)
ancestral political development (index of hierarchical	0.047	0.025
levels) - Alesina, Giuliano, and Nunn (2013)	(0.070)	(0.072)
ancestral economic development (index of settlement	0.011	0.011
patterns) - Alesina, Giuliano, and Nunn (2013)	(0.046)	(0.046)
Contemporary Economic Controls		
natural resources rents as a percentage of GDP in 2013	-0.008	-0.008
- The World Bank	(0.006)	(0.007)
international trade as a percentage of GDP in 2013	0.004***	0.004***
- The World Bank	(0.001)	(0.001)
value added in agriculture as a percentage of GDP in 2013	0.005	0.014
- The World Bank	(0.010)	(0.009)
value added in industry as a percentage of GDP in 2013	-0.018**	-0.014
- The World Bank	(0.007)	(0.009)
percentage of national land area that is potentially arable	-0.000	0.001
- FAO	(0.002)	(0.002)

Table 7 (contd.)
Gender and Corruption: Cross-Country IV Estimates –
Baseline, Historical, Contemporary Economic, & Socio-Cultural Controls
Dependent Variable = The World Bank's Control of Corruption Indicator for 2013

Variable	2SLS Coeff. Ests.	
Socio-Cultural Controls		
measure of national ethnic fractionalisation	-0.571***	-0.582**
- Alesina, Devleeschauwer, and Easterly (2003)	(0.203)	(0.229)
percentage of the population of European descent	-0.002	-0.001
- Nunn and Puga (2012)	(0.004)	(0.004)
percentage of Catholics in the population	0.376*	0.309
- McCleary and Barro (2006)	(0.203)	(0.275)
percentage of Protestants in the population	1.353***	1.188*
- McCleary and Barro (2006)	(0.299)	(0.640)
percentage of other Christian sects in the population	0.909*	0.858*
- McCleary and Barro (2006)	(0.478)	(0.493)
percentage of Muslims in the population	0.763*	0.470**
- McCleary and Barro (2006)	(0.437)	(0.203)
percentage of Hindus in the population	0.756	0.467
- McCleary and Barro (2006)	(0.598)	(0.335)
Adjusted R-squared	0.82	0.81
N	108	105

Notes: robust standard errors in parentheses; * significant at 10%, ** significant at 5%, *** significant at 1%

Notes

1. http://www.transparency.org/cpi2014/in_detail#myAnchor7
2. Plato believed that "women have an inferior virtue than men" and Aristotle that "women lack moral virtue in the same moderation".
3. 4th century BC
4. https://ucr.fbi.gov/crime-in-the-u.s/2013/crime-in-the-u.s.-2013/tables/table-42

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