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ABSTRACT

This study investigates whether the share of women in parliaments of recipient countries may influence the impact of aid on corruption in recipient countries. In order to account for nonlinear effects of variables determining corruption, we follow a quantile regression approach for panel data. By observing a sample of African countries, our results reveal that, bringing their social preferences into the political process, women may raise the effectiveness of foreign aid by reducing cases of corruption because of closer correspondence between their social preferences and the aims of aid. This is particularly true in less developed countries, where aid mainly concern social objectives such as health, education, gender gap, childcare, and water sanitation. Moreover, the positive effect of women' involvement is greater where the pre-existing level of corruption is higher.

Keywords: Corruption, Aid, Gender, Quantile regression.

JEL Classification: C21, D73, F35, J16.

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1. Introduction

In recent decades, the effectiveness of aid has been strongly questioned not only because of its doubtful efficacy in boosting the economic development of recipient countries, but also its perverse effects on corruption (Knack, 2001; Tavares, 2003; Moyo, 2009). The main motivation is that, similarly to the case of "natural resources course", the huge amount of resources available through foreign aid raises the incentives for politicians and bureaucrats to engage in corrupting activities (Djankov et al., 2008). Although this argument is well founded both theoretically and empirically, it needs to be further explored since, as several authors have highlighted, the perverse effects of foreign aid on the level of corruption could be either mitigated or amplified depending on the pre-existing quality of the socio-political institutions and level of corruption of recipient countries. Our paper develops this line of research by testing, in the case of sub-Saharan African countries, whether the presence of women in the policy-making process may reduce the perverse effects of aid on corruption and whether this effect is modified by the pre-existing level of corruption. To this extent, we use the quantile regression estimator for panel data (QRPD) developed by Powell (2016) in a framework of instrumental variables, which helps to solve endogeneity problems, with time-additive fixed effects and country non-additive fixed effects.

Several authors have advanced the hypothesis that the identity of policy makers matters, especially gender identity, considered an important dimension to explain the aims and the effectiveness of policy interventions (Chattopadhyay, Duflo, 2004; Brollo, Troiano, 2016). In this line, we advance the hypothesis that a higher presence of women in Parliaments renders more effective the use of aid resources, by reducing corruption and avoiding their distraction from the social purposes for which they have been collected. The idea that women are more trustworthy and socially oriented than men is also supported by considerable empirical literature mainly focused on less developed countries[1]. Nevertheless, the effect of women's political participation does not appear to be always conclusive. This may be due to the interaction between the corruption level and the effectiveness of whatever factor is able to reduce corruption itself. The hypothesis of nonlinearity in the effects of factors affecting corruption has been tested by several authors. Billger and Goel (2009) and Okada and Samreth (2012), for example, find that factors that reduce corruption, such as economic freedom and democracy, have greater effects in countries with low levels of corruption. The non-linearity in the effects of the corruption's determinants, makes very difficult designing good policies aimed at sustaining less developed countries trough foreign aid, which cannot be completely

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[1]Croson and Gneezy (2009) contain a comprehensive review of this literature.

avoided given the high frequency of humanitarian crises, caused by wars, natural disasters and climate change.

Against this background, we argue that women, bringing their social preferences into the political process, may raise the effectiveness of foreign aid by reducing cases of corruption because of closer correspondence between their social preferences and the aims of aid which, particularly in African countries, mainly concern social objectives and social infrastructures such as health, education, the gender gap, childcare, and water sanitation. Our results confirm that greater involvement of women in aid governance makes the use of resources more effective by reducing the probability of misappropriation. This effect is greater where the pre-existing level of corruption is higher.

In what follows, Section 2 describes the methodology and data, Section 3 presents the results, and Section 4 concludes.

2. Methodology and data

Our empirical analysis aims to detect the impact of foreign aid on corruption and whether women's political empowerment has a role in reducing a possible perverse effect of aid on corruption. Data on recipient countries' levels of corruption are obtained by rescaling the Worldwide Governance Indicator "Control of Corruption"[2]. Our variables of interest are: foreign aid (*Aid*) expressed as the share of the country's GDP (OECD Creditor reporting system); the share of seats held by women in national parliament (Inter Parliament Union); the interaction term *Aid*Women*. The latter allows the direct effect of women in parliament on corruption to be disentangled from the indirect effect due to "good management" of foreign aid, favored by greater involvement of women in political decisions. Following the existing literature, we include a parsimonious vector of control variables to account for institutional, economic and social factors influencing the country's corruption level (Tavares, 2003). In particular, for the quality of institutions we include: an index of the degree of democracy (*Polity* from the Polity IV project), capturing significant national political changes; an index of perceptions of political stability (from WGI), which accounts for risks of riots and terrorist incidents; the former colonizer's influence, given by a binary dummy variable that we set equal to one if the former colonizer is also the major donor[3] and zero otherwise. Finally, we include an index of fractionalization[4], to capture the effect of a high heterogeneity of population, and per capita GDP[5] to account for the influence of economic development on both corruption and female political

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[2] A larger value indicates a higher level of corruption (values from -2.5 to 2.5)
[3] Following some authors we hypothesize that former colonial links are a determinant in giving aid (Rajan, Subramanian, 2008), and relationships between donor and recipient may favor corruption (Moyo, 2009).
[4] See Alesina et al. (2003).
[5] We take the GDP of 2010 from the World Bank.

empowerment. All variables refer to 35 sub-Saharan African countries and, in order to encompass short-term business cycle noises and correlation effects, they are taken as three-year timespans from 1998 to 2015 and lagged of one period in order to control for simultaneity problems.

To tackle the omitted variables problem, we include time and country fixed effects in the baseline OLS model to account for sources of variability not adequately controlled by other covariates. Nevertheless, due to reverse causality between aid and corruption (Alesina, Dollar 2000), we run an IV regression to eliminate all other sources of endogeneity. We use as an instrument the infant mortality rate (Mishra, Newhouse, 2009) as a proxy of health conditions that may cause larger inflows of foreign aid, devolved to ensure satisfaction of the population's basic needs, which are not correlated with the level of corruption. In addition, we build a new instrument correlated with donors' internal conditions, to account for social and political pressures behind decisions to send aid[6]. In particular, for each recipient, we select the five major donors, for which we calculate a ratio between the inflow of asylum seekers and domestic population. The average of these ratios is our instrument. The idea is that higher inflows of refugees increase the host population's awareness of the economic problems and humanitarian crises plaguing less developed countries and hence raise its willingness to send aid.

To account for the nonlinear effects of variables determining corruption, we use the QRPD estimator with non-additive country fixed effects and instrumental variables. We opt for non-additive fixed effects since additive ones could change the distribution of corruption at country level, by not providing any information about the effects of the factors determining corruption on the outcome distribution.

3. Results

In the estimation results (Table 1) the baseline OLS and IV regressions show that aid raises levels of corruption. The coefficient of the interaction term between women in parliament and aid is negative, as expected, and statistically significant, while the coefficient of the term that captures the direct effect of women in parliament not linked to a "virtuous use" of foreign aid, contrary to what might be expected, is positive. This may be due to the nonlinearity of the effects of determinants of corruption. Indeed, QRPD results confirm that the effects of corruption determinants differ throughout the conditional distribution of corruption across countries. Aid has no perverse effect on corruption in countries with low levels of corruption, but shows a positive and increasing coefficient in countries with medium and high levels of corruption. The direct effect of

women on corruption is strongly nonlinear, showing a negative coefficient for countries with low and medium levels of corruption, but positive, albeit not significant, for higher levels of corruption. This maybe explained with gender differences in risk aversion: women are less likely to engage in corruption where it is stigmatized, but equally likely to do where it is not (Esarey, Schwindt-Bayer, 2017). The most interesting finding is the indirect positive effect of women in parliament on corruption through aid. This positive impact is consistent throughout the distribution as it increases with the level of corruption. This evidence confirms that the effect of women in parliament through aid captures an independent and different channel through which women affect corruption and is consistent with the hypothesis of women's political preferences coinciding with aid goals. In order to verify this hypothesis, we tested the same model using aid for specific social goals, namely social infrastructures, water sanitation and health.

Table 1 – OLS, IV and QRPD estimation results

VARIABLES	OLS	IV	QR_10	QR_25	QR_50	QR_75	QR_90
Aid	1.757***	5.701***	-2.243***	-0.810***	1.394***	1.860***	1.871***
	(0.481)	(1.967)	(0.486)	(0.200)	(0.359)	(0.554)	(0.125)
Aid*W	-0.196***	-0.471***	0.122***	0.0313	-0.115***	-0.194***	-0.180***
	(0.0352)	(0.156)	(0.0180)	(0.0256)	(0.0279)	(0.0505)	(0.00760)
Women	0.0207***	0.0464***	-0.0221***	-0.0136***	0.00202	0.0137***	0.00919***
	(0.00466)	(0.0152)	(0.00294)	(0.00259)	(0.00464)	(0.00489)	(0.00103)
lnGDP	-0.321***	-0.380***	-0.113***	-0.0843***	-0.103***	-0.154***	-0.0752***
	(0.104)	(0.124)	(0.0182)	(0.0132)	(0.0162)	(0.0136)	(0.0116)
Polity	0.00448	-0.00799	-0.0213***	-0.0247***	-0.0380***	-0.0195***	-0.0446***
	(0.00753)	(0.0106)	(0.00787)	(0.00450)	(0.00286)	(0.00394)	(0.00229)
Influence	-0.0583	-0.0493	-0.0290	-0.0493	-0.0147	0.0147	-0.0220
	(0.0375)	(0.0438)	(0.0198)	(0.0445)	(0.0103)	(0.0409)	(0.0162)
Fractionalization			2.299***	2.448***	1.313***	1.244***	1.340***
			(0.0769)	(0.0409)	(0.104)	(0.0847)	(0.0497)
Political_stability	-0.0396	-0.00255	-0.0249	-0.106***	-0.167***	-0.140***	-0.147***
	(0.0396)	(0.0548)	(0.0258)	(0.0271)	(0.0239)	(0.0234)	(0.0127)
Observations	210	210	210	210	210	210	210
Number of countries	35	35	35	35	35	35	35

Note: Dependent variable: *Corruption*. Instruments in IV: Infant mortality, asylum seekers. Standard errors in parentheses. Significance levels ***, ** and * are at 1%, 5% and 10%, respectively. OLS and IV include country and time fixed effects. QR includes non-additive fixed effects.

The results in Table 2 confirm that the coincidence of interests between female political preferences and aid goals, rather than their honesty, is the channel through which women in parliaments strengthen their influence in increasing aid effectiveness. This is an important result given that much aid is devolved to health and social aims. As regards the other covariates, the sign of coefficients is consistent with the previous studies.

Table 2 – OLS, IV and QRPD estimation results by different aid sector

VARIABLES	OLS	IV	QR_10	QR_25	QR_50	QR_75	QR_90
Aid (Social_Infrastructures) *w	-0.340***	-0.958***	0.217***	-0.0691	-0.202***	-0.145***	-0.314***
	(0.0599)	(0.333)	(0.0168)	(0.0769)	(0.0317)	(0.0209)	(0.0220)
Aid (Health&Pop)*w	-0.624***	-1.710***	0.141***	-0.397*	-0.529***	-0.394***	-0.825***
	(0.106)	(0.575)	(0.00457)	(0.207)	(0.125)	(0.0469)	(0.0582)
Aid(Water&Sanitation) *w	-1.323**	-9.130**	0.273	-0.680	-1.834***	-0.172	-2.276***
	(0.598)	(4.065)	(0.318)	(0.819)	(0.269)	(0.530)	(0.235)
Observations	210	210	210	210	210	210	210
Number of countries	35	35	35	35	35	35	35

Note: Dependent variable: *Corruption*. Aid refers to specific sectors and is multiplied by 1000000; other explanatory variables are the same as in table 1. Complete results are available upon request. Standard errors are in parentheses*** p<0.01, ** p<0.05, * p<0.1. OLS and IV include country and time fixed effects. QR includes non-additive fixed effects.

4. Conclusion

This paper shows that, in a context of less developed countries like that of sub-Saharan Africa, greater involvement of women in the political decision process may have a positive impact on the quality of the political process itself as they manage to reduce the level of corruption above all through a better use of foreign aid. In fact, while the direct effect of women is nonlinear throughout the distribution of corruption, a strong linearity is found for the indirect effect. Our results demonstrate that, more than their honesty, is the correspondence between women social preferences in the political agenda and aid goals that lead them to put a greater effort in promoting interventions to improve social well-being. In particular, this positive influence appears to be stronger in more corrupt institutional contexts.

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