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Conference Paper

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Proceedings of the German Development Economics Conference, Berlin 2011, No. 15

Provided in cooperation with:
Verein für Socialpolitik

Reexamining the link between gender and corruption: The role of social institutions*

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This version: February 28, 2011

Abstract. In this paper we reexamine the link between gender inequality and corruption. We review the literature on the relationship between representation of women in economic and political life, democracy and corruption, and bring in a new previously omitted variable that captures the level of discrimination against women in a society: social institutions related to gender inequality. Using a sample of developing countries we regress corruption on the representation of women, democracy and other control variables. Then we add the subindex civil liberties from the OECD Development Centre's GID Data-Base as the measure of social institutions related to gender inequality. The results show that corruption is higher in countries where social institutions deprive women of their freedom to participate in social life, even accounting for democracy and representation of women in political and economic life as well as for other variables. Our findings suggest that, in a context where social values disadvantage women, neither political reforms towards democracy nor increasing the representation of women in political and economic positions might be enough to reduce corruption.

Keywords: Social institutions, Gender inequality, Corruption, OECD Development Centre's GID Data-Base

***JEL* codes:** D63, D73, J16

* We thank Stephan Klasen and Carola Grün for useful comments and discussion. The usual disclaimer applies.
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1 Introduction

Is there a link between gender inequality and corruption in a society? The studies of Swamy, Knack, Lee, and Azfar (2001) and Dollar, Fisman, and Gatti (2001) suggest that countries with greater representation of women in political and economic life tend to have lower levels of corruption. How can this relationship be explained?

This could be attributed to behavioral differences between men and women. As mentioned by Dollar et al. (2001), there are experimental studies and studies using survey data that find that, on average, women are less selfish and might have higher moral and ethical standards than men (e.g. Eagly and Crowley, 1986; Glover, Bumpus, Logan, and Ciesla, 1997; Eckel and Grossman, 1998; Rivas, 2008).[1] If one accepts that women are less selfish and align their actions on higher moral standards than men, having women in important political and economic positions might lead to less corruption in a country.

An alternative explanation is put forward by Swamy et al. (2001), who argue that the negative relationship between women's participation and corruption could be due to self-selection. Only a few women reach powerful positions, and these women possibly gain access to these positions as they are from the "better" part of the women's distribution. From a historical perspective, Goetz (2007) claims that it is gendered access to political positions that explains why women seem to be less corrupt than men. Excluded from male patronage networks, women are restricted in their opportunities for corrupt behavior. As they are newcomers or only few in the political or business sphere, women lack familiarity with the rules of illicit exchange to their own benefit. They try to assert their position by acting honestly and trustworthily. This all leads to fewer corrupt activities by women, but as time passes and more women get access to power this effect might vanish.

It can also be argued that the observed relationship between women's representation and corruption is spurious. Swamy et al. (2001) and Dollar et al. (2001) warn that even if one controls for other factors in the regression, the observed relationship at the cross-country level could be due to some unobserved variable which influences both female representation and corruption. For example, according to Sung (2003) it might be the political system in the form of liberal democratic institutions that influences both. Sung (2003) argues that institutions of *liberal democracy* increase women's participation in government through values like equality, pluralism, fairness and tolerance. Competitive elections, an independent judiciary and a free press, which are elementary to a liberal

[1] There are empirical studies that challenge the finding that women are the "fairer sex" (e.g. Andreoni and Vesterlund, 2001; Alhassan-Alolo, 2007; Alatas, Cameron, Chaudhuri, Erkal, and Gangadharan, 2009). Another investigation highlights that when women are in a powerful position, they take decisions that are closely related to women's needs (Chattopadhyay and Duflo, 2004).

democratic system, guarantee transparency and hold government officials accountable, thereby reducing corruption. Therefore, the negative effect of women's representation in government on corruption is spurious and vanishes when one includes a measure of democracy in the regression, which is empirically confirmed by Sung (2003). Swamy et al. (2001) draw attention to the "level of discrimination against women" as another possible omitted variable that drives both female participation and corruption. They claim that in countries that are more corrupt there is more discrimination against women and argue that in countries where traditions and clientelism prevail, there is a preference for men in power.

In this paper, we focus on the effect of discrimination against women on corruption in a society as we have a new measure of society's attitude towards gender inequality to empirically test this relationship. Swamy et al. (2001) do not explain how this relationship operates, but several studies deal with this issue in a direct or indirect way (Tripp, 2001; Inglehart, Norris, and Welzel, 2002; Rizzo, Abdel-Latif, and Meyer, 2007). The authors of these studies claim that society's attitude towards women influences how a political system functions and that it affects the positions women take in this system. Assuming that the level of corruption depends on the functioning of the political system, one could argue that society's attitude towards gender inequality has an impact on corruption.

The study of Tripp (2001) focuses on women's movements as a countervailing force to prevailing practices of corruption in Eastern and Southern Africa.[2] Political reforms at the beginning of the 1990s, including free and competitive elections, a multi-party system and freedom of expression and association were not enough to give women access to powerful positions and to curtail the practices of patronage and clientelism. Women could enter the system, but they were excluded from male-dominated networks and therefore from the benefits of clientelism. However, political reforms allowed the formation of social forces. The disadvantaged women organized in autonomous movements, which were broad-based, multi-ethnic and multi-religious. These movements crosscut cleavages and started to demand transparency and the removal of clientelistic networks.

A similar perspective is adopted by Inglehart et al. (2002) and Rizzo et al. (2007) who state that when a society favors gender equality, there is more tolerance in general, more personal freedom and individual autonomy. The absence of these values inhibits political reforms towards a democratic system. The study of Inglehart et al. (2002) finds that gender equality is the most important part of "self-expression values" appearing in post-industrial societies which directly contribute to both democratization and to a greater representation of women in politics. Focusing on Arab and non-Arab Muslim countries,

[2] Waylen (1993) makes a similar point for Latin America.

Rizzo et al. (2007) shows that even if democratic political institutions like elections, political parties or checks and balances are put in place, gender inequality can prevent these institutions from functioning well.

We empirically test on a sample of developing countries the relationship between social institutions related to gender inequality and the level of corruption, and contribute to the literature discussed above. We focus on public corruption, which refers to the misuse of public office for private gain. It comprises grand corruption, which refers to activities of top officials and big companies, and petty corruption, which refers to the activities of people at the lower end of hierarchies (Pardo, 2004). To proxy society's attitude towards gender inequality or what Swamy et al. (2001) call "level of discrimination against women" we introduce social institutions related to gender inequality into the analysis. These are long-lasting norms, traditions and codes of conduct that shape gender roles and influence the opportunities of women and men in a society. As suggested by e.g. De Soysa and Jütting (2007) and Branisa, Klasen, and Ziegler (2009b), these guiding principles of human behavior affect development outcomes and should not be neglected in the study of a society. We measure social institutions related to gender inequality with the subindex Civil liberties proposed in Branisa, Klasen, and Ziegler (2009a), which is based on variables from the OECD Development Centre's Gender, Institutions and Development Database (Jütting, Morrison, Dayton-Johnson, and Drechsler, 2008). This subindex captures society's attitude with regard to gender roles based on the freedom of women to participate in social life.

Our aim is to investigate whether society's attitude towards gender inequality matters for corruption once one takes into account the representation of women in parliament and business as well as the political system of a country. The hypothesis is that in a society where women's participation in social life is restricted, there is a higher level of corruption.

Even after controlling for democracy and political and economic participation of women, as well as for other factors, we find a robust and significant relationship between the subindex Civil liberties and the level of corruption. We show that social institutions related to gender inequality are an important factor for the study of corruption. In societies where women are deprived of their freedoms to participate in social life, corruption is higher. As should be clear from the various existing theories the exact causal mechanism behind this relationship is not obvious and it cannot be established in this study since we conduct a cross-sectional analysis. This implies that one needs to carefully investigate the context, as tackling corruption might require more than pushing democratic reforms and increasing female representation in political and economic positions. The rest of the

paper is organized as follows. Section 2 describes the data used, the empirical estimation and the main results, which are discussed in Section 3.

2 Empirical Estimation and Results

2.1 Data

The definition of all variables and descriptive statistics are presented in Tables 4, 5 and 6 in the Appendix. Measuring corruption is a complex task as it has many faces. There is public corruption, which refers to the misuse of public office for private gain, and corruption that comprises the collusion between firms or misuse of corporate assets (Svensson, 2005). Other authors differentiate between grand and petty corruption. Grand corruption refers to activities of top-officials and big companies. Petty corruption refers to the activities of people at the lower end of hierarchies (Pardo, 2004).

We use two different measures of public corruption in our estimations comprising grand and petty corruption. The first measure is the Corruption Perception Index (*CPI*) of Transparency International.[3] The CPI measures the level of corruption in a country. It is based on various data sources, business surveys and expert panels about perceptions of corruption, and is a comprehensive measure that covers the different forms of grand and petty corruption in business, politics and administration. It is continuous and ranges from 0 meaning high corruption to 10 meaning low corruption (Lambsdorff, 2006).

The second indicator is the Corruption in Government Index from the International Country Risk Guide (*ICRG*) provided by the Political Risk Services.[4] The ICRG index assesses the political risk associated with corruption and focuses in particular on those types of corruption that lead to instability in the political system as they distort the economic and financial environment, put foreign investments into risk and reduce the efficiency of government and business because people come to power not because of their ability but through patronage and clientelistic practices.[5] Hence, this measure gives the extent of political risk of instability that is assumed to increase with corruption. Therefore, it is only under certain conditions an indicator of the level of corruption. Whether the political risk of instability caused by corruption coincides with the level of corruption depends on the degree of tolerance towards corruption (Lambsdorff, 2006). The ICRG corruption index goes from 0 to 6 with 0 meaning high risk and 6 indicating low risk. Pearson correlation

[3] http://www.transparency.org/policy_research/surveys_indices/cpi.
[4] http://www.prsgroup.com/.
[5] http://www.prsgroup.com/ICRG_Methodology.aspx#PolRiskRating.

coefficient between both corruption measures is significant and is 0.58 indicating that both measures seem to capture different aspects of corruption.

The subindex Civil liberties (*Subindex Civil lib.*) is one of five composite indices (the others being subindex Family code, subindex Son preference, subindex Physical integrity, subindex Ownership rights) that measure social institutions related to gender inequality (see Branisa et al. (2009a)). These social institutions are conceived as long-lasting norms, traditions and codes-of conduct that find expression in traditions, customs and cultural practices, informal and formal laws and guide people's behavior and interaction. They shape gender roles and therefore the social and economic opportunities of men and women. We use the subindex Civil liberties in this study as it covers those social institutions that directly shape the opportunities of women to participate in social life. Hence, it reflects better their opportunities to gain power in politics and economics than the other subindices related to gender inequality. Indeed, we find that the subindex Civil liberties is the only subindex that is significant in the regression analysis. It is built out of two variables of the OECD Development Centre's Gender, Institutions and Development Database (Morrison and Jütting, 2005; Jütting et al., 2008), which are freedom of movement and freedom of dress. The variables measure whether women are allowed to go outside the house and whether they are obliged to use a veil or burqa to cover parts of their body in public. Both variables are ordinal taking the values 0, 0.5 and 1 with 0 indicating no restrictions and 1 indicating high restrictions on women.[6] They are proxies of civil liberties in a sense that when women are restrained to leave the house it is difficult to imagine that they can actively participate in social, political and economic life. Wearing a veil might be a form of self-determination and expression, and different traditions, styles and customs are connected to it. However, *forced* veiling is incompatible with agency, as it might be a sign of subordination in a society and might hinder interactions with other human beings - either as women cannot interact because they wear a veil or they can only interact if they wear a veil (Macdonald, 2006; Milallos, 2007). The subindex is the rescaled weighted sum of the two variables with the weights obtained from polychoric principal component analysis (Kolenikov and Angeles, 2009). The subindex goes from 0 (no gender inequality) to 1 (high gender inequality). As the subindex Civil liberties does not cover developed (OECD) countries, the subsequent empirical analysis focuses

[6] The variable dress code takes the value 0 if there are less than 50% of women that are obliged to follow a certain dress code, 0.5 if there are more than 50% of women forced to follow a certain dress code and 1 if all women are obliged to follow a certain dress code, or if it is punishable by law not to follow it. The variable freedom of movement is 0 if there are no restrictions of women's movement outside the home, 0.5 if (some) women can leave home sometimes, but with restrictions, and 1 if women can never leave home without restrictions (i.e. they need a male companion, etc.)

on developing countries. The list of countries covered by the subindex Civil liberties can be found in Table 1 in Appendix 4.

Insert Table 1 about here

Insert Figure 1 about here

The variables that are contained in the subindex could be considered as proxies for religion and therefore one could think that the subindex Civil liberties might be a proxy for religion as well. When investigating the variation of the subindex over religion, one observes that there is more variation within Muslim majority countries than in countries with either Christian majority or countries without Christian or Muslim majority (Table 1).[7] To further examine whether the subindex measures Muslim religion, we plot the subindex Civil liberties against the percentage of Muslim population in a country (Figure 1). It is true that countries having less than 50% Muslim population tend to have lower values on the subindex Civil liberties with the exception of India which scores 0.6 with about 15% of Muslim population. For countries with more than 50% Muslim population the subindex shows more variation. Noticeably, there are several countries that have more than 70% of Muslim population and the value 0 on the subindex Civil liberties.[8] Consequently, there is no perfect correspondence between the subindex and the percentage of Muslim population. Nevertheless, in the regressions we include a Muslim and a Christian dummy (*Muslim* and *Christian*) to control for the impact of religion, the left-out category being countries that have neither a majority of Muslim nor a majority of Christian population.[9]

To account for female representation, which is highlighted by e.g. Swamy et al. (2001) and Dollar et al. (2001), we include three measures of female representation. We take data from World Bank (2009) on the proportion of female legislators (*Parliament*), the female share in professional, technical, administrative and managerial positions (*Managers*),[10] and women's share of labor force (*Labor force*).

[7] The variable freedom of movement varies over all three religious categories, while the variable freedom of dress has almost no variation in countries having a Christian majority or countries without Christian or Muslim majority, except for India and Sri Lanka.

[8] Albania, Azerbaijan, Gambia, Guinea, Kyrgyz Republic, Mali, Morocco, Niger, Senegal, Sierra Leone, Tajikistan, Tunisia, Turkmenistan, Uzbekistan

[9] As Muslim religion is related to the subindex we also use the percentage of Muslim population instead of the two religion dummies in the regressions. The results are unchanged.

[10] Both indicators have been criticized (Bardhan and Klasen, 1999; Dijkstra, 2002). In some countries, for example communist ones, parliaments lack power and the representation of women in these parliaments does not reflect actual power of women. Moreover, female representation in parliament measures representation only at the national level and ignores women's participation at other levels of the state and

To capture democracy we choose the Electoral Democracy index (*Electoral democ.*) of Freedom House (2008) that takes the value 1 if there are competitive, universal, free and secret elections and a multiparty system. An alternative measure is the Polity2 index of the Polity IV Project that we use to check the robustness of the results as *Polity2* measures more closely liberal democracy (Marshall and Jaggers, 2009).[11] Unfortunately, it covers fewer countries than the Electoral democracy index.[12] Dollar et al. (2001), Swamy et al. (2001) and Sung (2003) use either the Civil Liberties index[13], the Political Rights index or the Freedom of the Press index of the Freedom House project as regressors in their empirical analysis to measure or to refine the measurement of democracy. It needs to be stressed that these measures are not without methodological problems as they include questions about bribing and other forms of corrupt behavior and are therefore by construction correlated with corruption. The Civil Liberties index includes questions on corruption that restrains free and independent media. The Political Rights index includes questions related to corruption in government. The Freedom of the Press index includes questions on the impact of corruption and bribery on content of the press. Moreover, Sung (2003) uses a rule of law index that is also problematic as rule of law is closely related to the prevalence of corruption. Therefore, from all Freedom House measures only the Electoral Democracy index is included in our regressions to account for democracy.

As additional controls we include:

- the log of GDP per capita in constant prices to control for the level of economic development as combatting corruption might be costly, and as poorer people might tend to engage more in corrupt activities (*log GDP*) [14] (Swamy et al., 2001);

- region dummies to capture geography and other unexplained regional heterogeneity, with Sub-Saharan Africa as the reference category (*SA* for South Asia, *ECA* for Europe and Central Asia, *LAC* for Latin America and Caribbean, *EAP* for East Asia and Pacific);

in civil society. A similar problem is attached to the representation of women in senior economic positions that measures only formal sectors. In addition, this indicator does not fluctuate much over years. However, given that there is a lack of data available for women's representation at the local and societal level as well as for informal economic participation and to be comparable to other studies, we use both measures.

[11] Current data for the Polity IV Project can be found at http://www.systemicpeace.org/polity/polity4.htm.

[12] We use averages over ten years to capture stability of democracy. For the 121 countries for which both Electoral democracy and Polity2 are available, the Pearson Correlation Coefficient between them is 0.90 and significant.

[13] The Civil liberties index from Freedom House (2008) measures civil liberties in general and is not to be mixed up with the subindex Civil liberties related to gender inequality.

[14] US$, PPP, base year: 2005.

- ethnic fractionalization as it might increase corruption through clientelistic networks, identity politics and patronage along ethnic lines (e.g. Tripp, 2001) (*Ethnic frac.*);

- literacy rates to control for the knowledge of the population about laws against corruption, and as higher education might come along with less tolerance towards corruption (Swamy et al., 2001) (*Literacy pop.*);

- a measure of trade openness as trade barriers increase the incentives for corrupt behavior between individuals and customs officials (Ades and Tella, 1997; Gatti, 2004) (*Openness*);

- a dummy indicating whether a country has never been a colony (*Not colony*) and a dummy measuring whether a country was a British colony (*British colony*) based on the Correlates of War 2 Project (2003) as corruption might also be linked to the history of colonialism (Swamy et al., 2001).

The subindex Civil liberties reflects the information available around the year 2000 and is not expected to change rapidly over time as social institutions are long-lasting and change only slowly and incrementally. For this reason, we use averages of the existing values over time in the case of all other variables to minimize the loss of observations due to missing values and to obtain a more stable value for the indicators used. For the corruption indicators representing our response variables we take averages over the years 2001 to 2005 for the CPI and in the case of the ICRG over the period 2000-2004 . For the other regressors we use averages over ten years (1996-2005), with the exception of ethnic fractionalization as changes in the ethnic composition of a country in less than 20 years are rare (Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg, 2003). Concerning the two democracy variables, choosing averages over ten years has the advantage of capturing the stability of a democratic system, which has been highlighted by Treisman (2007) as important for corruption. In addition, having a difference of five years between response variable and the regressors might help to alleviate endogeneity and capture delays until possible effects can be observed.

2.2 Empirical Estimation

We empirically test with multiple linear regressions whether the subindex Civil liberties s_i, which measures the freedom of social participation of women, is correlated with a response variable y_i capturing the level of corruption, after controlling for other factors

that have been described in the literature as possible determinants of corruption.[15] As was discussed previously, we consider that social institutions related to gender inequality are relatively stable and long lasting. Therefore, we assume that they do not depend on the response variable for the period considered.[16]

We run regressions as

$$y_i = \alpha + \beta s_i + \text{control variables}_i + \varepsilon_i \tag{1}$$

using information at the country level. We are mainly interested in testing the null hypothesis that coefficient β is zero at a statistical significance level of 10%. The control variables included to attenuate omitted variable bias are described in Table 4 in the Appendix. We acknowledge, however, that it is impossible to entirely rule out this problem.

To reproduce the findings from the literature, we first run a regression without the subindex Civil liberties to focus on the effects of democracy and representation of women, which have been largely discussed. In a second step, we add to the regressions the subindex Civil liberties as a measure of society's attitude towards gender inequality, as it can be argued that it is a variable that has been omitted in the previous regressions (Swamy et al., 2001). We run each specification for the two measures of corruption and use each time one of the two alternative measures of democracy. At the end, we present four regressions for each corruption indicator.

Preliminary regressions not reported here suggest that heteroscedasticity is a possible issue in our data and that there are influential observations that could drive the results. If our model is well specified, the OLS estimator of the regression parameters remains unbiased in the presence of heteroscedasticity, but the estimator of the covariance matrix of the parameter estimates can be biased and inconsistent, making inference about the estimated regression parameters problematic. Violations of homoscedasticity can lead to hypothesis tests that are not valid and confidence intervals that are either too narrow or too wide. To deal with heteroscedasticity, we run the regressions with OLS and 'heteroscedasticity-consistent' (HC) standard errors. As our sample sizes are less than 150, we use HC3 robust standard errors proposed by Davidson and MacKinnon (1993), which are

[15] Before conducting the multiple linear regression analysis, we account for the importance of GDP for corruption. We first run a simple linear regression of each corruption measure on log GDP. We then compute the estimated residuals from this regression and use them as the dependent variable in a new simple linear regression where the subindex Civil liberties is the only regressor. For both CPI and ICRG we obtain a negative and significant coefficient for the subindex Civil liberties which suggests that the subindex is able to account for something that goes beyond GDP when explaining corruption.

[16] In general, social institutions, i.e. normative frameworks, change only slowly and incrementally.

better with small samples.[17]

For all the regressions, we check whether the results concerning the subindex Civil liberties are stable in three ways. First, it is clear that in the multiple regressions, the estimate of the effect of our main variable, the subindex Civil liberties, depends on the values of the other explanatory variables included (Mukherjee, White, and Wuyts, 1998). We also try a simpler model to confirm that the estimated coefficient of the subindex Civil liberties is negative and statistically significant. In this smaller model and based on the arguments presented before, we include as additional regressors the variables capturing the representation of women in society, a measure of democracy, the log GDP, religion dummies and regional dummies. This has the advantage that less parameters have to be estimated with the available observations.

Secondly, we use bootstrap with 1000 replications to compute a Bias-corrected and accelerated (Bca) 90% confidence interval of the regression coefficients computed with OLS to confirm that the value zero is not contained in the confidence interval around β (Efron and Tibshirani, 1993). One of the main advantages of bootstrapping methods is that one does not make any assumptions about the sampling distribution or about the statistic. Third, we detect observations with high influence or leverage based on the first estimates (OLS with standard variance estimator) using Cook's distance. Cook's distance is a commonly used estimate of the influence of a data point when doing least squares regression, and it measures the effect of deleting a given observation. We exclude the countries identified as outliers from the sample if the value of Cook's distance is larger than $4/n$, with n being the number of observations, and re-estimate equation 1 on the restricted sample using HC3 robust standard errors.

One should consider that possible endogeneity of the regressor s_i (the subindex Civil liberties), meaning that s_i is correlated with the error term ε_i in the regression, might lead to an estimated coefficient of s_i that is biased. Endogeneity might arise due to omitted variables, measurement error and simultaneity (Wooldridge, 2002). The control variables included in the regression aim at minimizing omitted variable bias, albeit one cannot rule out this problem. We do not find it plausible that there are measurement errors in s_i which are related to the unobserved 'true' social institutions. Simultaneity could arise if s_i is

[17] Simulation studies by Long and Ervin (2000) have shown that HC standard error estimates tend to maintain test size closer to the nominal alpha level in the presence of heteroscedasticity than OLS standard error estimates that assume homoscedasticity. These authors recommend the use of HC3 robust standard errors, especially for sample sizes less than 250, as they can keep the test size at the nominal level regardless of the presence or absence of heteroscedasticity, with only a minor loss of power associated when the errors are indeed homoscedastic. We acknowledge that heteroscedasticity-consistent standard errors are not a panacea for inferential problems under heteroscedasticity. As pointed out by some authors, there are limitations and trade-offs in these estimators (e.g. Kauermann and Carroll, 2001; Wilcox, 2001).

determined simultaneously with the dependent variable y_i. As was discussed previously, social institutions related to gender inequality s_i are relatively stable and long-lasting. Hence, it is unlikely that the response variable y_i influences s_i.

2.3 Results

Results for the CPI as the first measure of corruption are presented in Table 2. Specifications (1) and (2) do not include the subindex Civil liberties. In both specifications, none of the democracy variables Electoral democracy and Polity2 are significant. From the three measures of representation of women only Parliament is significant and positively related to corruption in specification (1) where Electoral democracy is the measure of democracy. Of the control variables only GDP has a significant and positive coefficient. In specifications (3) and (4) the subindex Civil liberties is added as a new regressor to the former specifications. Its coefficient is negative and significant in both. Both democracy variables as well as the measures for participation of women in the economy are not significant. Only Parliament carries a positive and significant coefficient when Electoral democracy is used (specification (3)). In the same specification (3) two control variables besides log GDP become significant: British colony and the regional dummy for ECA. For all four specifications the adjusted R square is around 0.5.

Table 3 shows the results when ICRG is used as the measure of corruption. For all 4 specifications (1-4), none of the variables reflecting representation of women and none of the democracy measures is significant. Interestingly, log GDP is also insignificant in all specifications, whereas it is always significant when the CPI is used as measure of corruption. Openness is the only control variable which is significant in all specifications. Important for the results of this paper, the subindex Civil liberties is significant in specifications (3) and (4), and adding it to the corresponding regressions yields values for adjusted R-square that are noticeably larger than without it. It must be noted, however, that the obtained values for adjusted R-square for the regressions with the ICRG are lower than for the CPI (between 0.2 and 0.3 for the ICRG and around 0.5 for the CPI), suggesting that the model is not able to explain much of the variation of the political risk of instability due to corruption.

Insert Table 2 about here

Insert Table 3 about here

Estimating a simpler model to reduce problems of multicollinearity does not change the results for the subindex Civil liberties and the variables measuring representation of

women and democracy. These findings do also withstand the two other robustness checks. First, we confirm with Bias-corrected and accelerated (Bca) confidence intervals that in all cases the value zero is not contained in the 90% confidence interval around the regression coefficient of the subindex Civil liberties. Secondly, excluding outliers (6 to 7 countries) and re-running specifications (3) and (4) for both corruption measures, the subindex Civil liberties remains significant in all estimations. It is worth mentioning that for every restricted sample, the adjusted R-square is higher than in the corresponding complete sample.[18]

Summarizing the results, when we do not include the subindex Civil liberties we find that from all variables for representation of women only Parliament is significant in the case of the CPI as long as Electoral democracy is used as measure of democracy. If one uses Polity2 instead, Parliament becomes insignificant. None of the democracy measures turns out to be significant. When we include the subindex Civil liberties, the results for representation of women and the democracy variables stay unchanged. Neither representation of women, except Parliament in the case of CPI when Electoral democracy is used, nor the democracy variables are significantly related to corruption. The main result concerning the subindex Civil liberties is that even after controlling for democracy and for measures of political and economic participation of women as well as for other factors, we find a robust and significant relationship between the subindex Civil liberties, which reflects society's attitude towards gender inequality, and the level of corruption. Social institutions favoring gender inequality are associated with higher levels of corruption.

3 Conclusion

The literature investigating the link between gender and corruption finds that there is a relationship between female representation in political and economic life and the level of corruption in a country. However, some studies warn that the observed relationship may be due to omitted variable bias. A possible variable that might influence both participation of women and corruption, is liberal democracy (e.g. Sung, 2003). We introduce a further omitted variable that has either been neglected in the literature or not been adequately dealt with because of insufficient data. Swamy et al. (2001) refer to this as the "level of discrimination against women" and proxy it with the gaps in educational attainment and life expectancy between men and women. We use the subindex Civil liberties, which we consider a better proxy of the "level of discrimination against women" as it captures

[18] Results for all the robustness checks are not reported here, but are available upon request.

social institutions that restrict women in their freedom to participate in the public and reflect society's attitude towards gender inequality. The subindex measures underlying institutions and not outcomes of these institutions as do the variables used by Swamy et al. (2001).

When we replicate the findings of the literature for our sample of developing countries without the social institutions indicator, the results support the hypothesis of Sung (2003) and others that, when liberal democracy (in our case measured with Polity2) is considered in the regression, the representation of women in political and economic life is insignificant. However, Sung's hypothesis is weakened by the fact that there is no statistically significant association between democracy and corruption. Consequently, our statistical results support neither Sung's arguments nor the arguments put forward by Swamy et al. (2001) and Dollar et al. (2001) that representation of women is negatively related to corruption.[19] These results make it difficult to interpret social institutions related to gender inequality as an omitted variable when one investigates the relationship between representation of women in society, democracy and corruption.[20]

Once we include the subindex Civil liberties as a regressor, we find that after controlling for representation of women in political and economic life and for democracy, it has a robust negative and significant effect on corruption. Consequently, the main finding of this study is that in countries where social institutions inhibit the freedom of women to participate in social life, the level of corruption is higher.

Admittedly, one has to be cautious with these results. Interpretations for these findings in the light of the theories discussed are difficult, and country or regional studies are needed. Measurement is another relevant issue as the concepts of social institutions, democracy, participation of women and corruption are all hard to operationalize. Finally, it cannot be ruled out that another factor, which has been neglected from the analysis, shapes the results.

Nevertheless, we derive one policy implication from this study, which should be mainly targeted at developing countries. In a context where social institutions deprive women of the freedom to participate in social life, neither political reforms towards democracy nor the representation of women in political and economic positions might be enough to reduce corruption. How women are treated in a society is not only important for them,

[19] Once again, our sample includes only developing countries, while the other studies include developed countries as well.

[20] We have estimated with multivariate regressions, not reported here, whether there is (1) a relationship between democracy and the subindex Civil liberties and (2) a relationship between representation of women in society and the subindex Civil liberties in our sample of developing countries, but did not find significant results.

but has major implications for the functioning of the whole society.

Tables and Figures

Table 1: Variation of the Subindex Civil Liberties Over Religion

Subindex Civil liberties	No christian/ Muslim majority	Christian majority	Muslim majority	Total
0	22	46	15	83
0.298	5	8	1	14
0.301	1	0	4	5
0.599	1	0	15	16
0.781	0	0	2	2
0.818	0	0	1	1
1	0	0	2	2
Total	29	54	40	123

Figure 1: Scatter Plot: Subindex Civil Liberties Against Percentage of Muslim Population

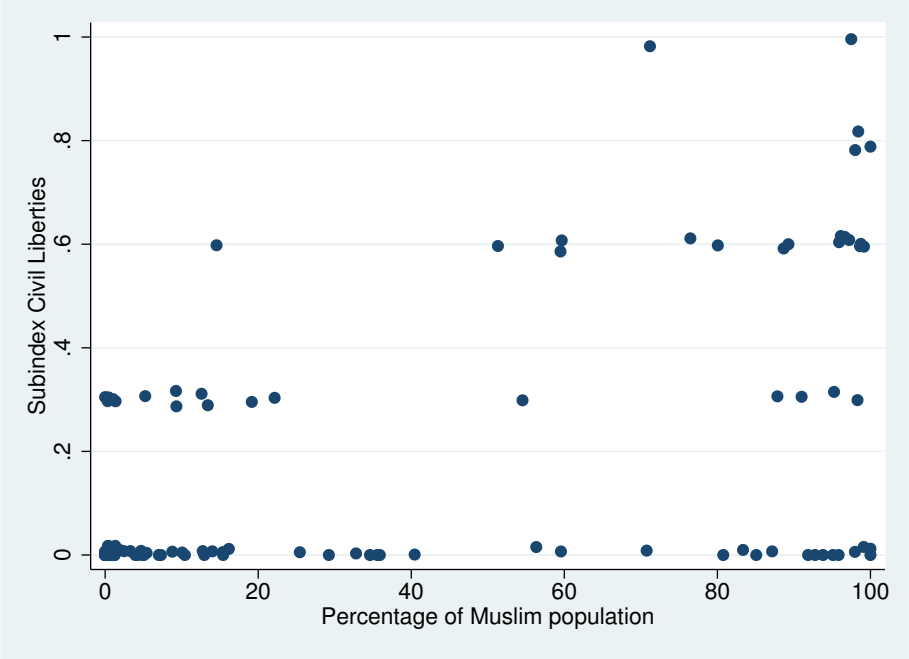

Table 2: Linear Regressions With Dependent Variable CPI

	Model 1	**Model 2**	**Model 3**	**Model 4**
Representation of women				
Parliament	0.031*	0.033	0.032*	0.037
	(0.018)	(0.023)	(0.018)	(0.023)
Managers	0.025	0.022	0.011	0.006
	(0.029)	(0.032)	(0.031)	(0.034)
Labor force	0.007	0.009	0.001	0.004
	(0.009)	(0.010)	(0.010)	(0.011)
Democracy				
Electoral democ.	0.339		0.263	
	(0.234)		(0.231)	
Polity2		0.039		0.032
		(0.025)		(0.023)
Social inst. related to gender ineq.				
Subindex Civil lib.			**-1.730*** **	**-1.624***
			(0.593)	**(0.866)**
log GDP	0.710***	0.738***	0.766***	0.821***
	(0.197)	(0.212)	(0.193)	(0.209)
Muslim	-0.367	-0.271	0.049	0.107
	(0.319)	(0.394)	(0.305)	(0.363)
Christian	-0.392	-0.240	-0.280	-0.131
	(0.288)	(0.341)	(0.283)	(0.329)
Ethnic frac.	-0.334	-0.364	-0.267	-0.124
	(0.628)	(0.824)	(0.595)	(0.809)
Literacy pop.	-0.928	-1.122	-0.470	-0.831
	(1.070)	(1.193)	(1.009)	(1.091)
Openness	1.457	1.752	1.199	1.455
	(1.106)	(1.435)	(1.063)	(1.378)
Not colony	0.135	0.146	0.331	0.197
	(0.315)	(0.410)	(0.300)	(0.362)
British colony	0.478	0.313	0.611**	0.407
	(0.298)	(0.391)	(0.298)	(0.387)
constant	-3.305**	-3.455*	-3.364**	-3.809*
	(1.634)	(1.964)	(1.687)	(2.108)
Number of obs.	103	86	103	86
R2	0.576	0.580	0.613	0.607
Adjusted R2	0.491	0.474	0.530	0.501
Prob > F	0.000	0.000	0.000	0.000

HC3 robust standard errors in brackets.
Regional dummies included in all estimations.
$*p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Linear Regressions With Dependent Variable ICRG

	Model 1	**Model 2**	**Model 3**	**Model 4**
Representation of women				
Parliament	0.015	0.012	0.016	0.016
	(0.018)	(0.020)	(0.014)	(0.017)
Managers	0.025	0.025	0.010	0.011
	(0.021)	(0.021)	(0.017)	(0.019)
Labor force	-0.003	-0.000	-0.009	-0.006
	(0.007)	(0.008)	(0.007)	(0.008)
Democracy				
Electoral democ.	0.273		0.221	
	(0.234)		(0.223)	
Polity2		0.029		0.027
		(0.025)		(0.025)
Social inst. related to gender ineq.				
Subindex Civil lib.			**-1.488*** **	**-1.260** **
			(0.425)	**(0.604)**
log GDP	0.122	0.081	0.153	0.123
	(0.149)	(0.182)	(0.135)	(0.166)
Muslim	-0.337	-0.229	0.076	0.070
	(0.293)	(0.316)	(0.261)	(0.315)
Christian	-0.351	-0.321	-0.300	-0.289
	(0.272)	(0.338)	(0.257)	(0.333)
Ethnic frac.	0.507	0.349	0.655	0.652
	(0.427)	(0.465)	(0.410)	(0.496)
Literacy pop.	-0.165	0.118	0.404	0.436
	(0.930)	(0.988)	(0.769)	(0.873)
Openness	1.277**	1.523**	0.991*	1.274**
	(0.625)	(0.650)	(0.588)	(0.596)
Not colony	0.033	0.122	0.255	0.177
	(0.237)	(0.304)	(0.308)	(0.396)
British colony	-0.022	-0.055	0.131	0.067
	(0.228)	(0.289)	(0.210)	(0.293)
constant	0.474	0.529	0.461	0.351
	(1.082)	(1.193)	(0.924)	(1.094)
Number of obs.	86	72	86	72
R2	0.361	0.423	0.462	0.482
Adjusted R2	0.201	0.241	0.318	0.306
Prob > F	0.005	0.001	0.000	0.001

HC3 robust standard errors in brackets.
Regional dummies included in all estimations.
$*p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Appendix

Table 4: Description and Sources of Variables

Variables	Definition	Source
Measures of corruption		
CPI	Corruption Perception Index (CPI); comprehensive measure of the level of corruption in a country that covers the different forms of grand and petty corruption in business, politics and administration. ranges from 0 (high corruption) to 10 (low corruption) (average of existing values over the last five years)	Transparency International (TI)
ICRG	Corruption in Government Index assesses corruption within the political system and focuses in particular on those types of corruption that lead to instability in the political system (average of existing values over the last five years)	International Country Risk Guide (ICRG)
Representation of women		
Parliament	Proportion of seats held by women in national parliaments (%) (average of the existing values over the last 10 years)	World Bank (2009)
Managers	Proportion of professional and technical, administrative and managerial positions held by women (%) (average of the existing values over the last 10 years)	World Bank (2009)
Labor force	Female labor force participation rate (average of the existing values over the last 10 years)	World Bank (2009)
Democracy		
Electoral democ.	Index that qualifies countries as electoral democracy when there exist competitive, universal and free and secret elections and a multiparty system that can access the media for political campaigning, (average of the existing values over the last 10 years)	Freedom House (2008)
Polity2	Measure of democracy taking account of competitiveness of participation, institutions and procedures	Marshall and Jaggers (2009)

Continued on next page

Table 4 – continued from previous page

Variables	Definition	Source
	openness and competitiveness of executive recruitment and constraints on the chief executive, ranges from -10 (highly autocratic) to 10 (highly democratic) , score 0 means country is democratic (average of the existing values over the last 10 years)	
Social inst. related to gender ineq.		
Subindex Civil lib.	Subindex Civil liberties that captures the freedom of social participation of women	Branisa et al. (2009a)
Control variables		
log GDP	Log of GDP per capita, PPP (constant 2005 international $) (average over the last 10 years)	World Bank (2008)
SA	Countries get a 1 if located in region South Asia, 0 otherwise.	
ECA	Countries get a 1 if located in region Europe and Central Asia, 0 otherwise.	
LAC	Countries get a 1 if located in region Latin America and the Caribbean, 0 otherwise.	
MENA	Countries get a 1 if located in region Middle East and North Africa 0 otherwise.	
EAP	Countries get a 1 if located in region East Asia and Pacific 0 otherwise.	
Muslim	Countries get a 1 if at least 50 % of the population are muslim, 0 otherwise.	Central Intelligence Agency (2009)
Christian	Countries get a 1 if at least 50 % of the population are christian, 0 otherwise.	Central Intelligence Agency (2009)
Ethnic frac.	The ethnic fractionalization measure gives the probability that two individuals selected at random from a population are members of different groups. It is calculated with data on language and origin. The value 0 means complete homogeneity and 1 complete heterogeneity.	Alesina et al. (2003)
Literacy pop.	Literacy rate for the whole population	Human Development Report stats office

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Table 4 – continued from previous page

Variables	Definition	Source
	(average of the existing values over the last 10 years)	
Openess	Imports of goods and services (% of GDP)	World Bank (2008)
Not colony	Countries get a 1 if never colonized, 0 otherwise.	Correlates of War 2 Project (2003)
British colony	Countries get a 1 if former British colony, 0 otherwise.	Correlates of War 2 Project (2003)

Table 5: Descriptive statistics of variables used

Variable	N	mean	sd	min	max
Measures of corruption					
CPI	115	3.17	1.37	1.22	9.32
ICRG	97	2.17	0.74	0.25	4.32
Control of Corruption	124	-0.49	0.70	-1.61	2.33
Representation of women					
Parliament	119	10.76	7.03	0.00	29.56
Managers	120	7.98	5.26	0.00	23.70
Labor force	122	55.10	16.75	10.96	92.96
Democracy					
Electoral democ.	121	0.45	0.46	0.00	1.00
Polity2	98	1.09	6.08	-9.00	10.00
Social inst. related to gender ineq.					
Subindex Civil lib.	124	0.16	0.26	0.00	1.00
Control Variables					
log GDP	116	7.98	1.12	5.61	10.55
SA	125	0.06	0.23	0.00	1.00
ECA	125	0.14	0.34	0.00	1.00
LAC	125	0.18	0.38	0.00	1.00
MENA	125	0.14	0.35	0.00	1.00
EAP	125	0.14	0.35	0.00	1.00
Muslim	125	0.33	0.47	0.00	1.00
Christian	125	0.43	0.50	0.00	1.00
Ethnic frac.	121	0.51	0.24	0.04	0.93
Literacy pop.	122	0.74	0.22	0.17	1.00
Openness	120	0.45	0.26	0.01	1.91
Not colony	121	0.21	0.41	0.00	1.00
British colony	121	0.30	0.46	0.00	1.00

Table 6: Pearson Correlation Coefficient between subindex Civil liberties and control variables

log GDP	ρ	0.196	Muslim	ρ	0.570
	p-value	0.036		p-value	0.000
	Number of obs.	114		Number of obs.	123
SA	ρ	0.326	Christian	ρ	-0.396
	p-value	0.000		p-value	0.000
	Number of obs.	123		Number of obs.	123
ECA	ρ	-0.248	Ethnic	ρ	0.079
	p-value	0.006		p-value	0.392
	Number of obs.	123		Number of obs.	119
LAC	ρ	-0.289	Literacy population	ρ	-0.189
	p-value	0.001		p-value	0.039
	Number of obs.	123		Number of obs.	120
MENA	ρ	0.533	Openness	ρ	-0.071
	p-value	0.000		p-value	0.447
	Number of obs.	123		Number of obs.	118
EAP	ρ	-0.111	Not colony	ρ	-0.056
	p-value	0.221		p-value	0.549
	Number of obs.	123		Number of obs.	119
Muslim percent.	ρ	0.535	British colony	ρ	0.357
	p-value	0.000		p-value	0.000
	Number of obs.	120		Number of obs.	119

Table 7: Pearson Correlation Coefficient (ρ) between the Corruption Measures

		CPI	**ICRG**
CPI	ρ	1	
	obs	115	
ICRG	ρ	0.58	1
	p-value	0.0000	
	obs	93	97