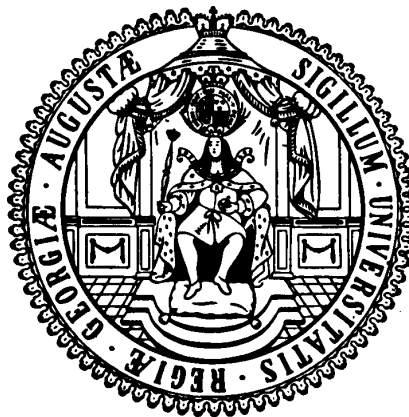


Courant Research Centre

‘Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis’

Georg-August-Universität Göttingen
(founded in 1737)



Discussion Papers

No. 24

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

Boris Branisa, Maria Ziegler

March 2010

Platz der Göttinger Sieben 3 · 37073 Goettingen · Germany
Phone: +49-(0)551-3914066 · Fax: +49-(0)551-3914059

Email: crc-peg@uni-goettingen.de Web: <http://www.uni-goettingen.de/crc-peg>

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

Boris Branisa[†]

Maria Ziegler[‡]

University of Goettingen
Department of Economics
Platz der Goettinger Sieben 3
37073 Goettingen, Germany

This version: March 3, 2010

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 Gender, Institutions and Development Database 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, it might not be enough to push democratic reforms and to increase the participation of women to reduce corruption.

Keywords: Social institutions, Gender inequality, Corruption.

JEL codes: D63, D73, J16.

* We thank Stephan Klasen for useful comments and discussion. The usual disclaimer applies.

[†] bbranis@uni-goettingen.de

[‡] mziegle@uni-goettingen.de

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?

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 orient 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 few women reach powerful positions, and these women possibly gain access to these positions as they are from the 'better' part from women's distribution.

From a historical perspective, [Goetz \(2007\)](#) claims that it is gendered access to political positions and resulting opportunities for corruption that explain why women seem to be less corrupt than men. Excluded from male patronage networks women are restricted in their opportunities for corrupt behavior. Being newcomers or too 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 less corrupt activities of women, but as time passes by and more women get access to power this effect might vanish.

From a methodological perspective, the relationship between women's representation and corruption has to be considered with caution as it could be 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 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

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](#)).

press that are elementary to a liberal 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 \(2003\)](#). Taking another perspective on democracy, [Cho \(2010\)](#) argues that democracy is what makes the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) work in terms of improving women's social rights. [Swamy et al. \(2001\)](#) draw one's attention to the "level of discrimination against women" as another possible omitted variable that drives both female participation and corruption, claiming that in countries which are more corrupt there is more discrimination against women. They argue that in countries where traditions and clientelism prevail, there is a preference for men in power.

In this paper, we center on the effect of discrimination against women on corruption as we have a new measure of society's attitude towards gender inequality to empirically test this relationship. Although [Swamy et al. \(2001\)](#) do not explain how this relationship operates, several papers deal with this issue in a direct or indirect way ([Tripp, 2001](#); [Inglehart, Norris, and Welzel, 2002](#); [Rizzo, Abdel-Latif, and Meyer, 2007](#)). These papers claim that society's attitude towards women influences how a political system functions and affects the position 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 South 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 praxis of patronage, clientelism and personal rule associated with a high degree of corruption. Women could enter the system, but they were excluded from the male-dominated networks and therefore from the benefits of clientelism. However, political reforms allowed the formation of social forces. Being disadvantaged women organized in autonomous movements. These broad-based multi-ethnic and multi-religious movements cross-cut 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

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

reforms towards a democratic system. The study of [Inglehart et al. \(2002\)](#) finds out that gender equality is the most important part of “self-expression values” appearing in the post-industrialization societies that contribute directly to both democratization and to a greater representation of women in politics. Focusing on Arab and non-Arab Muslim countries, [Rizzo et al. \(2007\)](#) highlights that even if democratic political institutions like elections, political parties or checks and balances are put in place, gender inequality can prevent that these institutions function well. Based on the results of [Inglehart et al. \(2002\)](#) and [Rizzo et al. \(2007\)](#) and on the finding that a stable and liberal democracy is related to lower levels of corruption even if one controls for representation of women in politics (e.g. [Sung, 2003](#); [Treisman, 2007](#)), we assume that society’s attitude towards gender inequality influences corruption by affecting the way political institutions function.

In this paper, 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 introduce social institutions related to gender inequality in the analysis as a proxy for society’s attitude towards gender inequality or what [Swamy et al. \(2001\)](#) call “level of discrimination against women”. Social institutions 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 the functioning of a society in general. As this study highlights it is relevant in the investigation of corruption in particular. We measure social institutions related to gender inequality with the subindex civil liberties proposed by [Branisa, Klasen, and Ziegler \(2009a\)](#) and based on variables from the OECD Gender, Institutions and Development Database ([Jütting, Morrison, Dayton-Johnson, and Drechsler, 2008](#)). This subindex captures society’s attitude with regards to gender roles based on the freedom of women to participate in social life.

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 measured with three alternative indicators. 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. This implies that one needs to carefully investigate the context, as tackling corruption might need 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 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 1 and 2. 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 three different measures of corruption in our estimations. 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 corruption within the political system 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 increases with corruption, and only under certain conditions it is 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.

The third measure chosen in this study is the Control of Corruption Index (CCI) of

³ Data are available at http://www.transparency.org/policy_research/surveys_indices/cpi.

⁴ <http://www.prsgroup.com/>.

⁵ http://www.prsgroup.com/ICRG_Methodology.aspx#PolRiskRating

the Governance Indicators developed by [Kaufmann, Kraay, and Mastruzzi \(2008\)](#). The CCI is the most encompassing measure of corruption of the three indices used. It is also a perception-based measure and captures public corruption including petty and grand corruption as well as systemic corruption covering state capture by the elite of a country or economic and private interests. The CCI lies between -2.5 and 2.5 with higher scores corresponding to a better outcome ([Kaufmann et al., 2008](#)). It combines various data sources and uses the ICRG corruption index as input. The CPI is not used for construction, but a subset of its data sources is. [Table 3](#) shows that the three measures have a positive and significant correlation even if it is not perfect. The highest correlation is between the CPI and the CCI (0.93) and the lowest between CPI and ICRG (0.58).

The subindex civil liberties (Subindex Civil lib.) is one of several composite indices that measure social institutions related to gender inequality ([Branisa et al., 2009a](#)). These 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. The subindex civil liberties covers those social institutions that directly shape the opportunities of women to participate in social life. It is built out of two variables of the OECD 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. 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 on developing countries.

To account for the female representation argument put forward 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),⁶ and women's share of labor force (Labor force).

⁶ 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 only representation at the national level and ignores women's participation at other levels of the state and in civil society. A similar problem is attached to the representation of women in senior economic positions that only measures formal sectors. In addition, this indicator does not fluctuate much over years.

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. As alternative measure we use the Polity2 index of the Polity IV Project to check the robustness of the results as it measures more closely liberal democracy ([Marshall and Jaggers, 2009](#)).⁷ Unfortunately, it covers fewer countries than the Electoral democracy index.⁸ [Dollar et al. \(2001\)](#), [Swamy et al. \(2001\)](#) and [Sung \(2003\)](#) use either the Civil liberties index⁹, 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 all of 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, only the Electoral democracy index of [Freedom House \(2008\)](#) 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)¹⁰ ([Swamy et al., 2001](#));
- a Muslim and Christian dummy to control for the impact of religion (Muslim and Christian), the left-out category being countries that have neither a majority of Muslim nor a majority of Christian population;
- region dummies to capture geography and other unexplained regional heterogeneity, with Subsaharan Africa as the reference category (SA for South Asia, ECA for

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.

⁷ Current data for the Polity IV Project can be found at <http://www.systemicpeace.org/polity/polity4.htm>.

⁸ 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.

⁹ 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.

¹⁰ US\$, PPP, base year: 2005.

Europe and Central Asia, LAC for Latin America and Caribbean, EAP for East Asia and Pacific);

- 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 [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 in the case of all other variables averages of the existing values over time 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, over the period 2000-2004 in the case of the ICRG and over 2000-2005 for the CCI. 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 democratic experience in a country that proxies the stability of a democratic system and 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 linear regressions whether the subindex civil liberties s_i , which captures 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. 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.¹¹

We run regressions as

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

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 1 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 effect of democracy and of 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 an important variable that has been omitted in the previous regressions (Swamy et al., 2001). We run each specification for the three measures of corruption and using each time one of the two alternative measures proxying for democracy. At the end, we have 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

¹¹ In general, social institutions, i.e. normative frameworks, only change slowly and incrementally.

better with small samples.¹²

For all the regressions, we check whether the results concerning the subindex civil liberties are stable using two approaches. First, 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. Second, 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 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 4. Specifications (1) and (2) do not include the subindex civil liberties. In specification (1) where Electoral democracy is the measure of democracy, from all three measures of representa-

¹² 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).

tion of women only Parliament is significant and positively related to corruption. Electoral democracy is insignificant, as are all other regressors, with the exception of log GDP. In specification (2) where Polity2 is the measure of democracy, this variable is statistically significant, while none of the three variables reflecting the representation of women is.

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. Electoral democracy as well as the measures for participation of women are not significant. Of the control variables besides log GDP, two become significant: British colony and the regional dummy for ECA. Here, democracy measured by Polity2 is positively related to corruption, whereas the measures of representation of women as well as all the other regressors except log GDP are not significant. For all four specifications the adjusted R square is around 0.5.

The regression results for the CCI are shown in Table 5 and are similar to the ones obtained for the CPI. In specifications (1) and (2) both democracy measures are significant. Parliament is only significant in (1) when Electoral democracy is used. From the other regressors, log GDP, the dummy for ECA, Openness, and Not colony are significant. In (2) none of the measures reflecting the representation of women is significant. From the other control variables, log GDP and Openness are significant. When the subindex civil liberties is included in the regressions (3) and (4), its coefficient is negative and significant in both cases. The variables that were significant before in (1) remain significant in (3). In (4), Polity2 remains significant, but there are some changes for other variables with respect to (2). In (4) ECA is now significant, and Openness becomes insignificant. As for the CPI the adjusted R-square for the four regressions is approximately 0.5.

Table 6 shows the results when the ICRG is used as the measure of corruption. These are qualitatively different from the previous ones, as could be expected because this measure focuses more on the political risk of instability related to corruption. For all 4 specifications (1-4), none of the variables reflecting the representation of women and none of the democracy measures is significant. Interestingly, log GDP is also insignificant in all specifications, whereas it was always significant when the CPI or the CCI were used as measures 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 other two measures of corruption (between 0.2 and 0.3 for the ICRG and around 0.5 for the CPI and the CCI), suggesting that the model is not able to explain

much of the variation of the political risk of instability due to corruption.

These findings withstand the two 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. Second, excluding outliers (6 to 8 countries) and re-running specifications (3) and (4) for all three 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. Additionally, one could be concerned about the number of regressors used. We started with a simpler model where the only control variables used besides the ones reflecting democracy and the representation of women are the log of GDP per capita, a Muslim dummy, a Christian dummy, and region dummies. The regression results concerning the subindex civil liberties, which are available upon request, are similar to the ones reported here where we additionally control for other factors.¹³

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 and the CCI, as long as Electoral democracy is used as measure of democracy. If one uses Polity2, Parliament becomes insignificant. Whether democracy is significant depends on the corruption measure used and on how democracy is measured. Polity2 is significant for both CPI and CCI, whereas Electoral democracy is significant only in the CCI specification. For the ICRG neither representation of women nor democracy are significant variables. When we include the subindex civil liberties, none of the democracy variables is related to the CPI. Nevertheless, representation of women in parliament is associated with the CPI when Electoral democracy is used. In the case of the CCI the democracy variables are related to corruption and as before Parliament remains significant in the specification with Electoral democracy. Noticeably, neither the variables measuring representation of women nor democracy are associated with the ICRG index. This could be explained by the focus of the measure on political risk of corruption. Even log GDP which is consistently related with the CPI and CCI is not significant in the case of the ICRG. As these results are somewhat surprising, and as the adjusted R-square is relatively low, we focus on the CPI and CCI in the following discussion, even if the subindex civil liberties is significant in the regression for the ICRG.

The main result of this study is that even after controlling for democracy and for measures of political and economic participation of women as well as for other factors that have been proposed in the literature, we find a robust and significant relationship between

¹³ Results for the robustness checks are not reported here, but are available upon request.

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 out 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 can 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 either has been neglected in the literature or has 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 social institutions that restrain 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 the 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. Once we include the subindex civil liberties as a regressor, the main finding is 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. In countries where social institutions inhibit the freedom of women to participate in social life, the level of corruption is higher.

There are several interpretations for this finding. First, if social institutions define for all spheres of society whether women have power and say, and if women behave differently than do, this makes a difference for corruption (e.g. [Dollar et al., 2001](#); [Swamy et al., 2001](#)). Second, regardless of whether women are the fairer sex or not, social institutions related to gender inequality are relevant for democratic political institutions to evolve and to function well so that accountability and control mechanisms make it possible to fight corruption. Personal freedom, individual autonomy and tolerance are values that are

less developed in societies with social institutions that deprive women of their freedoms (Norris and Inglehart, 2002; Rizzo et al., 2007).¹⁴ We have shown elsewhere that the functioning of a political system measured by the governance indicators ‘rule of law’ and ‘voice and accountability’ from Kaufmann et al. (2008) is negatively related to the degree of inequality in social institutions (Branisa et al., 2009b).¹⁵ Moreover, finding that gender-related social institutions are associated with corruption, although one controls for representation of women in the regressions, might reflect that even if democracy exists and women are in the system, their power is not equivalent to that of men because they are either excluded from male patronage networks or have limited possibilities to organize and to countervail corrupt practices (Tripp, 2001).

Admittedly, one has to be cautious with these results. As it becomes evident from the literature review, the dependencies between the four variables, society’s attitude towards gender inequality, female representation, democracy and corruption are very complex, and have to be investigated in country or regional studies. Furthermore, the concepts of social institutions, democracy, participation of women and corruption are all hard to operationalize, and the measures used in this study could be contaminated by measurement error. 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 bring down corruption. How women are treated in a society is not only important for themselves, but has major implications for the functioning of the whole society.

¹⁴ We have estimated with multivariate regressions not reported here, whether there is a relationship between democracy and the subindex civil liberties in our sample of developing countries, but did not find significant results.

¹⁵ Implicitly this paper supports this hypothesis as well, if one regards corruption as an indicator of the functioning of a political system.

References

- Ades, A. and R. D. Tella (1997). The new economics of corruption: A survey and some new results. *Political Studies* 45(3), 496–515.
- Alatas, V., L. Cameron, A. Chaudhuri, N. Erkal, and L. Gangadharan (2009). Gender, culture, and corruption: Insights from an experimental analysis. *Southern Economic Journal* 75(3), 663–680.
- Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, and R. Wacziarg (2003). Fractionalization. *Journal of Economic Growth* 8(2), 155–194.
- Alhassan-Alolo, N. (2007). Gender and corruption: Testing the new consensus. *Public Administration and Development* 27, 227–237.
- Andreoni, J. and L. Vesterlund (2001). Which is the fair sex? Gender differences in altruism. *The Quarterly Journal of Economics* 116(1), 293–312.
- Bardhan, K. and S. Klasen (1999). UNDP's Gender-related indices: A critical review. *World Development* 27, 985–1010.
- Branisa, B., S. Klasen, and M. Ziegler (2009a). New measures of gender inequality: The social institutions and gender index (SIGI) and its subindices. Courant Research Centre: Poverty, Equity and Growth - Discussion Papers 10, University of Goettingen.
- Branisa, B., S. Klasen, and M. Ziegler (2009b). Why we should all care about social institutions related to gender inequality. Courant Research Centre: Poverty, Equity and Growth - Discussion Papers 15, University of Goettingen.
- Central Intelligence Agency (2009). The world factbook. Electronic publication. <https://www.cia.gov/library/publications/the-world-factbook/>.
- Chattopadhyay, R. and E. Duflo (2004). Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica* 72(5), 1409–1443.
- Cho, S.-Y. (2010). International human rights treaty to change social patterns – The convention on the elimination of all forms of discrimination against women. CEGE Discussion Paper Series 93, University of Goettingen.
- Correlates of War 2 Project (2003). Colonial / dependency contiguity data v3.0. Electronic publication. <http://correlatesofwar.org/>.

- Davidson, R. and J. G. MacKinnon (1993). *Estimation and Inference in Econometrics*. New York: Oxford Univ. Press.
- De Soysa, I. and J. Jütting (2007). Informal institutions and development: How they matter and what makes them change. In J. Jütting, D. Drechsler, S. Bartsch, and I. de Soysa (Eds.), *Informal Institutions. How Social Norms Help or Hinder Development*, pp. 29–43. Paris: OECD Development Centre.
- Dijkstra, A. G. (2002). Revisiting UNDP's GDI and GEM: Towards an alternative. *Social Indicators Research* 57, 301–338.
- Dollar, D., R. Fisman, and R. Gatti (2001). Are women really the “fairer” sex? Corruption and women in government. *Journal of Economic Behavior & Organization* 46(4), 423–429.
- Eagly, A. H. and M. Crowley (1986). Gender and helping behavior: A meta-analytic review of the social psychological literature. *Psychological Bulletin* 100(3), 283 – 308.
- Eckel, C. C. and P. J. Grossman (1998). Are women less selfish than men? Evidence from dictator experiments. *The Economic Journal* 108(448), 726–735.
- Efron, B. and R. Tibshirani (1993). *An Introduction to the Bootstrap*. New York: Chapman and Hall.
- Freedom House (2008). Freedom in the world 2008. Technical report, Freedom House. <http://www.freedomhouse.org>.
- Gatti, R. (2004). Explaining corruption: Are open countries less corrupt? *Journal of International Development* 16(6), 851–861.
- Glover, S. H., M. A. Bumpus, J. E. Logan, and J. R. Ciesla (1997). Re-examining the influence of individual values on ethical decision making. *Journal of Business Ethics* 16, 1319–1329.
- Goetz, A. M. (2007). Political cleaners: Women as the new anti-corruption force? *Development and Change* 38(1), 87–105.
- Inglehart, R., P. Norris, and C. Welzel (2002). Gender equality and democracy. *Comparative Sociology* 1(3-4), 321–345.

- Jütting, J., C. Morrison, J. Dayton-Johnson, and D. Drechsler (2008). Measuring gender (In)Equality: The OECD gender, institutions and development data base. *Journal of Human Development* 9(1), 65–86.
- Kauermann, G. and R. J. Carroll (2001). A note on the efficiency of sandwich covariance matrix estimation. *Journal of the American Statistical Association* 96(456), 1387–1396.
- Kaufmann, D., A. Kraay, and M. Mastruzzi (2008). Governance matters VII: Aggregate and individual governance indicators, 1996-2007. World Bank Policy Research Working Paper 4654, World Bank.
- Kolenikov, S. and G. Angeles (2009). Socioeconomic status measurement with discrete proxy variables: Is principal component analysis a reliable answer? *Review of Income and Wealth* 55(1), 128–165.
- Lambsdorff, J. G. (2006). Measuring corruption - The validity and precision of subjective indicators (CPI). In C. Sampford, A. Shacklock, C. Connors, and F. Galtung (Eds.), *Measuring Corruption*, Law, Ethics and Governance Series, Chapter 5, pp. 81–99. Aldershot: Ashgate.
- Long, J. S. and L. H. Ervin (2000). Using heteroscedasticity consistent standard errors in the linear regression model. *The American Statistician* 54(3), 217–224.
- Marshall, M. G. and K. Jaggers (2009). Polity IV project: Political regime characteristics and transitions, 1800-2008. Electronic publication. <http://www.systemicpeace.org/polity/polity4.htm>.
- Morrison, C. and J. P. Jütting (2005). Women’s discrimination in developing countries: A new data set for better policies. *World Development* 33(7), 1065–1081.
- Norris, P. and R. Inglehart (2002). Islamic culture and democracy: Testing the “clash of civilizations” thesis. *Comparative Sociology* 1, 235–263.
- Pardo, I. (2004). *Between Morality And The Law: Corruption, Anthropology And Comparative Society*. Aldershot: Ashgate.
- Rivas, M. F. (2008). An experiment on corruption and gender. The Papers 08/10, Department of Economic Theory and Economic History of the University of Granada.

- Rizzo, H., A.-H. Abdel-Latif, and K. Meyer (2007). The relationship between gender equality and democracy: A comparison of Arab versus non-Arab muslim societies. *Sociology* 4(6), 1151–1170.
- Sung, H.-E. (2003). Fairer sex or fairer system? Gender and corruption revisited. *Social Forces* 82(2), 703–723.
- Svensson, J. (2005). Eight questions about corruption. *Journal of Economic Perspectives* 19(3), 19–42.
- Swamy, A., S. Knack, Y. Lee, and O. Azfar (2001). Gender and corruption. *Journal of Development Economics* 64(1), 25–55.
- Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annu. Rev. Polit. Sci.* 10, 211–244.
- Tripp, A. M. (2001). Women’s movements and challenges to neopatrimonial rule: Preliminary observations from Africa. *Development and Change* 32, 33–54.
- Waylen, G. (1993). Women’s movements and democratization in Latin America. *Third World Quarterly* 14(3), 573 – 587.
- Wilcox, R. (2001). Comment. *The American Statistician* 55(4), 374–375.
- Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge: MIT Press.
- World Bank (2008). World development indicators. Technical report, World Bank.
- World Bank (2009). GenderStats. Electronic publication. <http://genderstats.worldbank.org>.

Appendix

Definition of variables and descriptive statistics

Table 1: 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)
CCI	Control of corruption Index captures public corruption including petty and grand corruption as well as systemic corruption covering state capture by the elite of a country or economic and private interests (average of existing values over the last five years)	Kaufmann et al. (2008)
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	Freedom House (2008)

Continued on next page

Table 1 – continued from previous page

Variables	Definition	Source
Polity2	<p>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)</p> <p>Measure of democracy taking account of competitiveness of participation, institutions and procedures 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)</p>	Marshall and Jaggers (2009)
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	Alesina et al. (2003)

Continued on next page

Table 1 – continued from previous page

Variables	Definition	Source
Literacy pop.	<p>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.</p> <p>Literacy rate for the whole population (average of the existing values over the last 10 years)</p>	Human Development Report (HDR) stats office
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 2: 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 3: Pearson Correlation Coefficient (ρ) between the Corruption Measures

		CPI	ICRG	CCI
CPI	ρ	1		
	obs	115		
ICRG	ρ	0.58	1	
	p-value	0.0000		
	obs	93	97	
CCI	ρ	0.93	0.64	1
	p-value	0.0000	0.0000	
	obs	115	97	124

Regression results

Table 4: Linear regressions with dependent variable CPI

	(1)	(2)	(3)	(4)
	coef/se	coef/se	coef/se	coef/se
Representation of women				
Parliament	0.029* (0.017)	0.031 (0.022)	0.030* (0.018)	0.035 (0.022)
Managers	0.026 (0.029)	0.022 (0.032)	0.011 (0.031)	0.006 (0.034)
Labor force	0.007 (0.009)	0.009 (0.010)	0.000 (0.010)	0.004 (0.011)
Democracy				
Electoral democ.	0.360 (0.231)		0.282 (0.230)	
Polity2		0.042* (0.025)		0.034 (0.023)
Social inst. related to gender ineq.				
Subindex civil lib.			-1.741*** (0.597)	-1.621* (0.867)
Control variables				
log GDP	0.720*** (0.200)	0.746*** (0.214)	0.775*** (0.196)	0.828*** (0.211)
SA	-0.368 (0.558)	-0.282 (0.633)	-0.009 (0.592)	0.118 (0.771)
ECA	-0.496 (0.662)	-0.673 (0.956)	-1.102* (0.653)	-1.067 (0.865)
LAC	-0.026 (0.539)	-0.190 (0.690)	-0.347 (0.497)	-0.483 (0.621)
MENA	0.967 (0.683)	0.881 (0.883)	0.804 (0.705)	0.718 (0.924)
EAP	-0.036 (0.515)	-0.187 (0.648)	-0.187 (0.504)	-0.264 (0.610)
Muslim	-0.359 (0.319)	-0.258 (0.392)	0.059 (0.306)	0.121 (0.361)
Christian	-0.369 (0.283)	-0.220 (0.336)	-0.258 (0.280)	-0.111 (0.327)
Ethnic frac.	-0.305 (0.632)	-0.347 (0.830)	-0.240 (0.598)	-0.107 (0.815)
Literacy pop.	-0.990 (1.091)	-1.172 (1.218)	-0.524 (1.028)	-0.882 (1.115)
Openness	1.453 (1.119)	1.752 (1.449)	1.194 (1.073)	1.455 (1.392)
Not colony	0.164 (0.309)	0.175 (0.403)	0.359 (0.291)	0.227 (0.354)
British colony	0.486 (0.298)	0.319 (0.391)	0.620** (0.298)	0.412 (0.388)
constant	-3.329** (1.656)	-3.462* (1.977)	-3.387* (1.705)	-3.815* (2.118)
Number of observations	104	87	104	87
Adjusted R2	0.489	0.474	0.529	0.501
Prob > F	0.000	0.000	0.000	0.000

HC3 robust standard errors in brackets.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Linear regressions with dependent variable CCI

	(1) coef/se	(2) coef/se	(3) coef/se	(4) coef/se
Representation of women				
Parliament	0.014* (0.008)	0.013 (0.009)	0.014* (0.008)	0.015 (0.009)
Managers	0.013 (0.013)	0.016 (0.014)	0.008 (0.013)	0.008 (0.014)
Labor force	0.003 (0.004)	0.005 (0.004)	0.000 (0.004)	0.002 (0.005)
Democracy				
Electoral democ.	0.298** (0.117)		0.280** (0.117)	
Polity2		0.027** (0.013)		0.024** (0.012)
Social inst. related to gender ineq.				
Subindex civil lib.			-0.781*** (0.248)	-0.784** (0.374)
Control variables				
log GDP	0.388*** (0.094)	0.394*** (0.107)	0.406*** (0.092)	0.430*** (0.103)
SA	0.074 (0.300)	0.171 (0.321)	0.220 (0.301)	0.345 (0.357)
ECA	-0.633* (0.357)	-0.671 (0.499)	-0.914** (0.351)	-0.862* (0.452)
LAC	-0.144 (0.288)	-0.182 (0.373)	-0.297 (0.262)	-0.325 (0.332)
MENA	0.346 (0.340)	0.400 (0.435)	0.276 (0.331)	0.321 (0.439)
EAP	-0.179 (0.272)	-0.249 (0.337)	-0.249 (0.258)	-0.290 (0.318)
Muslim	-0.075 (0.155)	-0.070 (0.196)	0.130 (0.149)	0.112 (0.175)
Christian	-0.236 (0.144)	-0.193 (0.183)	-0.192 (0.141)	-0.145 (0.174)
Ethnic frac.	-0.161 (0.292)	-0.161 (0.352)	-0.128 (0.285)	-0.054 (0.351)
Literacy pop.	-0.497 (0.484)	-0.535 (0.543)	-0.262 (0.454)	-0.368 (0.492)
Openness	0.835* (0.435)	0.996* (0.529)	0.738* (0.420)	0.853 (0.518)
Not colony	0.310* (0.166)	0.287 (0.217)	0.394** (0.178)	0.309 (0.205)
British colony	0.128 (0.159)	0.064 (0.213)	0.179 (0.161)	0.115 (0.218)
constant	-3.913*** (0.738)	-4.001*** (0.854)	-3.925*** (0.741)	-4.139*** (0.890)
Number of observations	110	92	109	92
Adjusted R2	0.510	0.485	0.539	0.508
Prob > F	0.000	0.000	0.000	0.000

HC3 robust standard errors in brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Linear regressions with dependent variable ICRG

	(1) coef/se	(2) coef/se	(3) coef/se	(4) coef/se
Representation of women				
Parliament	0.015 (0.017)	0.012 (0.020)	0.015 (0.014)	0.016 (0.017)
Managers	0.022 (0.020)	0.025 (0.021)	0.010 (0.017)	0.011 (0.019)
Labor force	-0.003 (0.007)	-0.000 (0.008)	-0.010 (0.007)	-0.006 (0.008)
Democracy				
Electoral democ.	0.266 (0.225)		0.229 (0.217)	
Polity2		0.030 (0.025)		0.028 (0.024)
Social inst. related to gender ineq.				
Subindex civil lib.			-1.492*** (0.423)	-1.261** (0.599)
Control variables				
log GDP	0.134 (0.148)	0.084 (0.182)	0.156 (0.136)	0.125 (0.166)
SA	0.117 (0.534)	0.193 (0.535)	0.409 (0.461)	0.480 (0.509)
ECA	-0.267 (0.553)	-0.409 (0.705)	-0.768 (0.542)	-0.610 (0.701)
LAC	0.242 (0.387)	0.279 (0.470)	0.027 (0.347)	0.122 (0.460)
MENA	0.311 (0.545)	0.347 (0.629)	0.125 (0.415)	0.245 (0.547)
EAP	-0.529 (0.418)	-0.701 (0.459)	-0.628 (0.381)	-0.693 (0.447)
Muslim	-0.360 (0.287)	-0.225 (0.312)	0.080 (0.260)	0.074 (0.312)
Christian	-0.337 (0.268)	-0.319 (0.337)	-0.295 (0.256)	-0.287 (0.333)
Ethnic frac.	0.502 (0.418)	0.356 (0.465)	0.665 (0.405)	0.658 (0.495)
Literacy pop.	-0.202 (0.925)	0.113 (0.988)	0.395 (0.769)	0.432 (0.873)
Openness	1.244** (0.616)	1.525** (0.650)	0.991* (0.590)	1.275** (0.595)
Not colony	0.041 (0.232)	0.129 (0.298)	0.264 (0.303)	0.184 (0.385)
British colony	-0.001 (0.226)	-0.054 (0.288)	0.133 (0.210)	0.068 (0.292)
constant	0.456 (1.090)	0.517 (1.194)	0.442 (0.926)	0.341 (1.092)
<hr/>				
Number of observations	88	73	87	73
Adjusted R2	0.206	0.252	0.325	0.316
Prob > F	0.003	0.001	0.000	0.000

HC3 robust standard errors in brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$