ASIAN-PACIFIC ECONOMIC LITERATURE
Crawford School of Economics and Government
The Australian National University, Canberra

doi: 10.1111/apel.12214

The gender-corruption nexus in Asia

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This study investigates the relationship between the share of women in parliament and the level of corruption in a panel of Asian countries during the period 1997–2015. This study applies the instrumental variable (IV) fixed effect approach using a system of gender quotas, which are either reserved seats, legal candidate quotas, or voluntary political party quotas as instruments to control for unobserved heterogeneity across countries, and to alleviate endogeneity bias. In addition, the generalised method of moments (GMM) estimator is applied in order to address the persistence of corruption, which causes biased and inefficient estimators in estimation. The main finding is that a higher share of women in parliament is associated with a lower level of corruption, which is consistent with evidence from studies by Dollar et al. (2001) and Swamy et al (2001).

Introduction

Several empirical studies have indicated that the level of corruption will be less when women hold a larger share of national parliamentary seats. Although the number of women in parliaments and the leadership role of women in Asian countries has grown over the past 30 years, this region has struggled to solve the issue of corruption, which remains a major obstacle to development.

Dollar et al. (2001:423) showed that 'the greater [the] representation of women in parliament, the lower the level of corruption' and the main reason suggested for this finding was that 'men are more individually oriented (selfish) than women' Dollar et al. (2001:423). Following Dollar et al. (2001), many countries began to implement policies promoting the role of women in politics; among these, a system of gender quotas has been the most popular. Currently, more than half of the countries in the world use gender quotas as a tool to increase the number of women participating in politics (Bonomi et al., 2013).

Although several empirical studies have extended and re-examined the work initiated by Dollar et al. (2001), the findings have been mixed and the issue remains very controversial. Sung (2003) and Goetz (2007) even stated that it is all about the governance system, not gender; that is, the number of women participating in politics has no relationship to corruption. However, one conclusion of Dollar et al. (2001) was that the gender-corruption nexus varies substantially by region. This finding suggests that studies should focus on regions and take account of each region's particular characteristics.

Furthermore, a weakness of earlier studies is that they have used cross-country comparisons at a point in time; thus the estimated results could suffer from bias arising from

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unobserved heterogeneity across countries. Some recent studies, for example, Mishalova and Melnykovska (2009) and Debski and Jetter (2015), attempt to correct for this problem by using standard fixed-effect estimations on panel data sets; while Jha (2015) and Lauw (2015) use instrumental variable (IV) fixed effect regressions to correct for the problem of endogeneity of the share of women in parliament. However, the IV fixed effect can possibly capture only the endogeneity of the share of women in parliament, and other biases could still arise from correlations between other explanatory variables and the contemporaneous (or the lagged) errors. Therefore, this study proposes to use the generalised method of moments (GMM) estimator as an appropriate way to estimate this relationship.

The main objective of this study is to investigate the relationship between the share of women in parliament and the level of corruption, focusing on Asian countries over the period 1997–2015. The study applies both IV fixed effects and the GMM regressions to control for unobserved heterogeneity across countries, alleviate endogeneity, and address the persistence of corruption that causes biased and inefficient estimators.

The paper is organised as follows. The second section reviews relevant literature on the gender-corruption nexus. The third and fourth sections introduce the data and methodology used to estimate the relationship. The fifth section provides results and the last section is the conclusion.

Literature review

Dollar et al. (2001) showed that when the number of women in parliament increases, there is a reduction in the level of corruption. Based on the assumption that women are more honest than men, and controlling for socio-economic differences among 240 countries over the period 1982–95, the percentage of women in parliament was shown to have a negative relationship with the level of corruption as recognised in the International Country Risk Guide (ICRG) Index. This finding was supported by Swamy et al. (2001), who used different data sources and different indexes to measure corruption and female political participation, namely data from a survey firm in Georgia and an index from Freedom House, respectively. As a result of these findings, it was recommended that governments should encourage more women to engage in political institutions in order to reduce corruption.

Several empirical studies have tried to investigate the gender-corruption nexus using either the share of women in parliament or the share of women in the labour market as a proxy for gender representation in a country or region. In addition to using secondary data to measure the level of corruption, such as the Corruption Perception Index (CPI) and the ICRG Index, some studies have used laboratory experimental methods in investigating this issue (Alhassan-Alolo 2007; Alatas et al. 2009; Frank et al. 2011; Rivas 2013). Frank et al. (2011) argued that the experimental method is gaining recognition as it overcomes the limitations of using micro-data and field data.

Results from the laboratory could also provide more insights into gender differences in behaviour and attitudes towards corruption. Rivas (2013:10) applied 'typical bribery experiment' techniques to explore whether women and men would behave differently if they encountered similar situations and found that 'women are indeed less corrupt than men'. This result contradicts the findings of Alhassan-Alolo (2007) in which there is no gender difference in corruption behaviour in Ghana's public sector.

Some studies have compared gender differences across countries using experimental methods. Alatas et al. (2009) ran the same experiment in Australia, India, Indonesia, and Singapore, and found that differences in gender perspectives towards corruption existed only in Australia.

Sung (2003) argued that a 'fairer system' in politics is that of 'liberal democracy', a system wherein the main role played in reducing the level of corruption is through increasing

opportunities for female participation, not just the number of women in parliament. Sung (2003) found that there is no statistically significant relationship between women's political representation and corruption in 99 countries and territories. Goetz (2007:87) also argued that the 'gendered nature of access to politics and public life shapes opportunities for corruption'. Goetz (2007) insisted that if women had more access to politics and later could develop a system/network of corruption, this could mean an increase of corruption among women. Esarey and Chirillo (2013) also argued that political institutional structures determine the gender-corruption nexus.

Other factors thought to be related to corruption have been added to the gender-corruption relationship. Shukralla and Allan (2011) found neither women in parliament nor foreign aid had a significant effect on corruption in 76 countries during the 2000s, however well-established the democracy was. Samimi and Hosseinmardi (2011) used fixed-effect estimation on panel data for 25 selected developing countries in 2000–08 to study female participation in government and other related labour and social factors, such as the Human Development Index; they showed that female participation in parliament, as well as other factors, has an effect on reducing corruption.

These earlier studies, for example, Dollar et al. (2001), Swamy et al. (2001), and Sung (2003), consider democracy as one of the main control variables. To control for the type of political system, different indexes have been used, for example, the Civil Liberties Index, the Political Rights Index, and the Freedom of the Press Index. Treisman (2007) contended that when controlling for democracy, his results showed a robust negative correlation between women and corruption. Ades and Di Tella (1999) also argued that countries with higher levels of trade openness tend to have lower levels of corruption.

However, weak points of studies in this area are that most use cross-country comparisons at a given point in time. Dollar et al. (2001:427) concluded that 'obviously, some care is required in interpreting our results. Since we are dealing with cross-country data, it may be that some unobserved variable is causing both high female participation in government and low corruption'.

Similarly, Swamy et al. (2001:49) stated that 'despite our efforts, the possibility of omitted variable bias in a cross-sectional regression can never be entirely ruled out'. For example, 'it might be argued that societies in which "traditional" political values and clientelistic attitudes are prevalent may tend to choose "strong" male leaders, and may also be more tolerant of corruption, with no causal connection between those two phenomena'.

Cheung and Hernandez (2006) noted that the weakness of using cross-sectional data is the omission of unobserved variables that might affect the gender variable and cause bias in the estimation. Thus, using panel data will allow us to observe the impact of women's political participation on corruption in the sample countries over time. However, few studies have used panel data in estimating this gender-corruption nexus.

Mishalova and Melnykovska (2009) used the 28 transition economies of the former Soviet Union to show a significant negative relationship between the number and percentage of women in the upper and lower houses of parliament and corruption. However, other factors such as the percentage of women legislators and managers, 'which is the indicator of the presence of women in decision-making positions' (Mishalova and Melnykovska 2009:398) and the female participation rate had no impact. This result is consistent with the evidence from Samimi and Hosseinmardi (2011), who used data on 25 developing countries during the period 2000–08.

Next, Cheung and Hernandez (2006) used constructed panel data for US states (for 1984–2000) and applied states' fixed effects; they also included other control variables representing different characteristics of each state. No relationship between women in government and corruption was found; however, states' characteristics were shown to have an impact. This result is consistent with evidence

from local government in India, showing that although there are a large number of female politicians, gender does not have an impact on corruption (Vijayalakshmi 2008).

Recently, Debski and Jetter (2015) used panel data to reassess the gender-corruption linkage in 117 countries. Although no relationship between gender and corruption was found, the relationship differed significantly by region. The main finding showed a negative relationship between a higher share of women in parliament and corruption only in Asia and Oceania. The weakness of this study was not to control for unobserved heterogeneity across time and to ignore some important policy changes in the region, for example, the system of gender quotas in politics in some Asian countries. Furthermore, inclusion of the country fixed effect can reduce some problems of endogeneity, but the endogeneity bias can still arise from the possible endogeneity of women's share in parliament owing to omitted variables. IV fixed effect has been considered as another way to reduce this problem.

Jha's (2015) study was the first to discuss using IV for the share of women in parliament in estimating this relationship in 17 European countries. The main reason given was that the variable for women's share of representation in parliament tends to be endogenous as it can be correlated with unobserved variables relating to corruption. Two IVs related to the institutional context: (1) 'women's exposure to democratic rights as measured by the year they were granted suffrage'; and (2) 'years since transition to agriculture' are proposed and incorporated in the estimation (Jha 2015:19). The main finding is a negative correlation between women's share of representation in parliament, and corruption.

Next, Lauw (2015:79) introduced 'gender quotas in the form of party quotas, legislative quotas, and reserved seats quotas' as an IV to estimate the relationship between the share of women in parliament and corruption in 133 countries for the period 1984–2013. The results showed no statistically significant relationship between women's share of representation in parliament and corruption, except in the cases of Africa and Asia.

However, both standard fixed effects and IV fixed effects ignore the issue of the model's dynamics. The IV fixed effects can possibly capture the endogeneity of women in parliament; however, other biases may arise from a correlation between other explanatory variables and the contemporaneous (or lagged) errors as well, without controlling for the persistence of corruption. To control for that problem, the GMM estimators will be appropriate to use in this study.

Data

The panel data set used in this study was constructed from macroeconomic data for 38 countries in Asia for the period 1997–2015.[1] Note that this study covers all countries in Asia for which data sets concerning the share of women in parliament and GDP per capita are available.

The main dependent variable used is the level of corruption (*CORRUPT*). This study uses the CPI from Transparency International (2016). The index has values ranging from 0 (high corruption) to 100 (very clean or low corruption). The study applies the minus value (−) of CPI to indicate that high values represent high corruption. This prevents confusion about the scale and makes it much easier to interpret. The CPI was first released in 1995 and has been widely adopted as an indicator showing the current corruption situation for every country.

The main independent variable used in estimation is political participation and representation of women (*Women*). To measure the level of women's involvement, this study applies the

1 List of countries: (1) Azerbaijan; (2) Bahrain; (3) Bangladesh; (4) Bhutan; (5) Cambodia; (6) China; (7) Cyprus; (8) India; (9) Indonesia; (10) Iran; (11) Iraq; (12) Israel; (13) Japan; (14) Jordan; (15) Kazakhstan; (16) Korea (South); (17) Kuwait; (18) Kyrgyzstan; (19) Laos; (20) Lebanon; (21) Malaysia; (22) Maldives; (23) Mongolia; (24) Nepal; (25) Oman; (26) - Pakistan; (27) Philippines; (28) Russia; (29) Saudi Arabia; (30) Singapore; (31) Sri Lanka; (32) Syria; (33) Tajikistan; (34) - Thailand; (35) Turkey; (36) Uzbekistan; (37) Vietnam; (38) Yemen.

share of seats held by women in national parliaments as an indicator. This data set shows the parliamentary seats that were held by women in each country. The data are from the Inter Parliament Union. As most available data for Asian countries begin from 1997, this study uses this year as the starting period for the study.

For the IV estimation, the study identifies a system of quotas for women in a country (or gender quota) as an IV. If a country has any quota systems, which are reserved seats (constitutional and/or legislative), legal candidate quotas (constitutional and/or legislative), or political party quotas (voluntary), a quota dummy variable takes the value of one. This information was extracted from the Quota Project (2016).

The study adds other control variables with possible relationships with corruption as well as the opportunity for women to participate in politics. The control variables include *GDP per capita*; *Population*; *Education* (years of primary education); *Trade Openness* (the sum of exports and imports of goods and services measured as a share of GDP; taken from the World Development indicators of the World Bank (2016). In addition to these variables, an index of political rights (*Political Rights*) has been added in order to control for country differences in political systems. This variable is from Freedom House (2016). The summary statistics of all variables used in the estimation are shown in Table 1.

Methodology

The paper employs the specification of Dollar et al. (2001), and classical specifications to estimate the impact of women on corruption. The pooled panel data set was first estimated as specified in Equation (1):

$$CORRUPT_{it} = \gamma Women_{it} + X_{it}\beta + \varepsilon_{it} \quad (1)$$

where $CORRUPT_{it}$ is the CPI in country i and year t. $Women_{it}$ is the share of seats held by women in national parliaments. The set of control variables is represented by X_{it}. The variables included in X_{it} are *GDP per capita*, *Population*, *Education*, *Political Rights*, and *Trade Openness.*

This study applies the fixed-effect model, in which δ_i is the country fixed effect and τ_t is the year fixed effect, as specified in Equation (2):

$$CORRUPT_{it} = \gamma Women_{it} + X_{it}\beta + \delta_i + \tau_t + \varepsilon_{it} \quad (2)$$

The country fixed effect and the year fixed effect have been imposed in the estimated equation in order to control for unobservable heterogeneity across countries and times, for example, the differences in institutions, societies, history, geographical variables, and policy interventions in each country and time period that can affect the situation of women

Table 1
Summary statistics of variables

Variables	(1)	(2)	(3)	(4)	(5)
	N	Mean	SD	Min	Max
Corruption	495	−37.37	18.29	−94	−10
% Women in parliament	495	12.12	7.747	0	33.20
Trade openness	495	94.16	66.64	18.76	439.7
Political rights	495	4.339	1.970	1	7
Education	495	5.368	0.857	3	7
Quota for women	495	0.420	0.494	0	1
GDP per capita	495	8.083	1.406	5.706	10.55
Population	495	17.00	1.882	12.76	21.03
Country	495	18.77	10.57	1	38
Year	495	10.94	4.624	1	18
Number of countries	38	38	38	38	38

and corruption. The inclusion of country fixed effects and year fixed effects can assist in reducing the endogeneity that arises from measurement errors and omitted variable bias. Note that the Hausman test indicates that the fixed-effect model is the most appropriate estimation method.

However, there is possible endogeneity bias arising from the women's share in parliament attributable to variables omitted from the estimated equation. The IV fixed-effect estimation has been widely discussed as a way to reduce this problem. To do so the IV must be exogenous with respect to the corruption equation but have significant effects on the endogenous 'women's share in parliament' variable.

Lauw (2015) introduced the variable, 'quota for women', as an IV. Currently, the three types of gender quotas used in politics include reserved seats (constitutional and/or legislative); legal candidate quotas (constitutional and/or legislative); and political party quotas (voluntary) (Quota Project, 2016). The presence of a system of quotas for women is exogenous with respect to corruption, but it is expected to have an impact on the number of women in parliament.

The first stage specification of the IV fixed-effect estimation is specified in Equation (3):

$$Women_{it} = \pi_1 Quota_{it} + X_{it}\pi_2 + \delta_i + \tau_t + \varepsilon_{it} \quad (3)$$

where $Quota_{it}$ is a dummy variable identifying the countries that have a system of quotas for women during that time. Note that it could be any type of gender quotas as indicated above. This variable is equal to one if a country has a system of quotas for women at the time, and zero if not. X_{it} is the set of control variables. Note that this study first performs the first stage regression; the estimation of π_1 differs from zero and is statistically significant. This result indicates that quotas for women have a positive effect on the share of women in parliaments. The IV passes the test of validity (or is indicated as a weak IV).

However, even though we capture the endogeneity of women's share in parliament from the IV fixed-effect estimation, there is still a bias arising from the correlation between other explanatory variables and the contemporaneous (or the lagged) errors. In other words, bias might arise from endogeneity and the dynamics of the model. For example, the corruption incidence in the past can influence the current perception of corruption via many channels, such as government policy.

As a result, without controlling for the persistence of the corruption perception, there is a possibly omitted variable that is biased in estimation. Elbahnasawy (2014:118) mentioned that 'corruption seems to have inertia (corruption is a function of its initial level)' and there is a lag in time according to the implemented/enforced policy in the country. Thus, this study applies dynamic panel estimation to control for changes in explanatory variables that could be difficult to measure, for example, government policy related to corruption and women. In other words, using lagged values as a set of instruments captures the endogeneity and measurement errors of those explanatory variables. Incorporating lagged corruption in estimation allows control of both 'observed and unobserved historical factors' that affect the present stage of corruption (Elbahnasawy 2014:118).

The dynamic panel model used in estimation could be written as Equation (4):

$$CORRUPT_{it} = \gamma_1 CORRUPT_{it-1} + \gamma_2 Women_{it} + X_{it}\beta + \delta_i + \tau_t + \varepsilon_{it} \quad (4)$$

The standard fixed-effect model cannot be directly applied in this estimation of Equation (4), as the estimated parameters are biased and inconsistent. The main reason is that there is correlation between lagged dependent variables and error terms. In order to obtain a valid result, this study used the dynamic panel fixed effect in estimation.

First, Arellano and Bond (1991) proposed the difference GMM estimator, which takes the first-difference of all explanatory variables in order to get rid of the fixed effect, and then

instrumented these differenced variables with their lagged values in levels. The first-difference in the GMM method can be written as Equation (5):

$$\begin{aligned} &CORRUPT_{it} - CORRUPT_{it-1} \\ &= \gamma_1 (CORRUPT_{it-1} - CORRUPT_{it-2}) \\ &\quad + \gamma_2 (Women_{it} - Women_{it-1}) + (X_{it} - X_{it-1})\beta \\ &\quad + (\varepsilon_{it} - \varepsilon_{it-1}) \end{aligned} \tag{5}$$

However, Bond et al. (2001:3) argued that 'when the time series are persistent and the number of time series observations is small, the first-differenced GMM estimator is poorly behaved. The reason is that, under these conditions, lagged levels of the variables are only weak instruments for subsequent first-differences'. Consequently, the difference GMM estimator tends to result in a large bias and be imprecise (Blundell et al. 2000). Bond et al. (2001) suggested using the system GMM estimator instead, which was developed by Arellano and Bover (1995), and Blundell and Bond (1998).

Even though corruption differs significantly across countries, the time series of corruption variables from each country is quite persistent according to the data set used in this paper. Thus, the system GMM estimator, extended from the difference GMM estimator, is the most appropriate one. The system GMM was first proposed by Arellano and Bover (1995). Then, Blundell and Bond (1998) proposed the GMM system estimator, which assembles two main equations into a single system. The first equation is the first-differentiated equation; the instruments used in this equation are lagged level values of endogenous variable and first-differences of the exogenous variable. The second equation is the equation in levels; the instruments used in this equation are the lagged differences of endogenous variables. Blundell et al. (2000) stated that the system GMM estimator will improve precision and reduce the finite sample bias compared to the difference GMM estimator.

Results

The ordinary least square (OLS) regression results for the pooled sample reported in Table 2 indicate no relationship between the share of women in parliament and corruption, while GDP per capita, political rights, and population are statistically significant and have the expected signs. However, the estimated results from the OLS regression are biased and inefficient as a result of not controlling for unobservable heterogeneity across countries.

To control for the differences across countries and years, this study applied country and year fixed-effect regression in the estimations and the results are presented in Table 3. Columns (1)–(4) show no relationship between the share of women in parliament and corruption even when we control for unobserved heterogeneity across countries. GDP per capita, political rights, education, and population are statistically significant and show the expected signs.

The levels of corruption vary negatively according to the levels of country income, which is consistent with the previous study of Treisman (2007). Political rights,

Table 2
Pooled ordinary least square (OLS) regressions[1]

Variables	(1)	(2)
	Pooled OLS (without control)	Pooled OLS (with control)
% Women in parliament	−0.162 (0.104)	−0.0359 (0.0923)
GDP per capita		−6.549*** (1.020)
Trade openness		−0.0204 (0.0227)
Political rights		0.896** (0.385)
Education		0.504 (1.271)
Population		1.877* (1.114)
Constant	−33.59*** (3.145)	−19.42 (20.43)
Observations	495	495
Number of countries	38	38

***p < 0.01, **p < 0.05, *p < 0.1.
[1] Robust standard errors in parentheses.

Table 3
Standard fixed effect regressions[1]

Variables	(1)	(2)	(3)	(4)
	Fixed Effect (without control)	Fixed Effect (without control)	Fixed Effect (with control)	Fixed Effect (with control)
% Women in parliament	−0.174 (0.106)	−0.0686 (0.0894)	−0.144 (0.104)	−0.0771 (0.0918)
GDP per capita			−6.479*** (1.762)	0.0241 (3.251)
Trade openness			−0.000447 (0.0203)	−0.0238 (0.0206)
Political rights			0.602 (0.377)	0.532* (0.275)
Education			2.242 (1.462)	2.842* (1.445)
Population			11.70** (5.493)	33.64*** (7.100)
Constant	−35.27*** (1.285)	−36.55*** (1.919)	−196.8** (89.56)	−619.6*** (130.5)
Observations	495	495	495	495
R^2	0.032	0.219	0.108	0.366
Number of countries	38	38	38	38
Country fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	No	Yes	No	Yes

***p < 0.01, **p < 0.05, *p < 0.1.
[1] Robust standard errors in parentheses.

education, and population are statistically significant positive relationships with the level of corruption, confirming the findings in previous studies, for example, Dollar et al. (2001) and Swamy et al. (2001). However, this study finds no impact from the level of trade openness on corruption, which contradicts the conclusion of Ades and Di Tella (1999).

Results from both estimation methods indicate no relation between women's share of representation in parliament and the level of corruption. However, there is the possibility of endogeneity from the share of the women in parliament variable. To minimise this problem, this study conducts IV fixed-effect regressions, using a system of quotas for women as instruments for the share of women in parliament.

The first stage estimation shows that the instruments are correlated with the share of women in parliament. Thus, the presence of a system of gender quotas in some Asian countries leads to an increase in women's participation in politics in Asia and this policy could be viewed as a fast-track policy to promote women's representation in a country. The second stage results, reported in Table 4, indicate a negative relationship between the share of women in parliament and corruption. All estimates are statistically significant and robust across different specifications, and the coefficients range from −0.42 to −0.59. The absolute coefficient estimated for the share of women in the IV fixed-effect estimation is larger than in the analogous pooled OLS regression and the standard fixed-effect regression. This indicates the pooled OLS regression and standard fixed-effect regressions underestimate the effect of the share of women in parliaments on the level of corruption. The coefficients of GDP per capita, education, and population remain statistically significant and have the expected signs as determined in previous literature.

The difference GMM estimator results are presented in Column (1) in Table 5. As shown by Arellano and Bond (1991), the difference GMM estimator uses the lagged level values of endogenous variables as instruments in the first-differenced equation. Corruption and women are endogenous variables, while the exogenous variables are GDP per capita, population, education, political rights, and trade openness. Only GDP per capita shows a statistically significant relationship; the share of women in parliament is not significant. As previously mentioned, when the time series is persistent and short, the first-differenced GMM estimator could be biased

Table 4
Instrumental variable (IV) fixed effect regressions[1]

Variables	(1)	(2)	(3)	(4)
	IV fixed effect (without control)	IV fixed effect (without control)	IV fixed effect (with control)	IV fixed effect (with control)
% Women in parliament	−0.421*** (0.101)	−0.594** (0.234)	−0.570*** (0.214)	−0.464** (0.198)
GDP per capita			−3.434* (1.970)	0.0616 (1.723)
Trade openness			0.0153 (0.0172)	−0.0104 (0.0156)
Political rights			0.458 (0.349)	0.418 (0.298)
Education			2.084* (1.235)	2.382** (1.090)
Population			21.06*** (5.549)	35.67*** (4.171)
Observations	495	495	495	495
R^2	−0.034	0.049	−0.011	0.277
Number of countries	38	38	38	38
Country fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	No	Yes	No	Yes

***p < 0.01, **p < 0.05, *p < 0.1.
[1] Robust standard errors in parentheses.

Table 5
Generalised method of moments (GMM) results[1]

Variables	(1)	(3)
	Difference GMM	System GMM
Corruption = L	0.0494 (0.0863)	0.601** (0.272)
% Women in parliament	0.315 (0.260)	−0.428*** (0.133)
GDP per capita	−7.022** (3.355)	−3.032* (1.760)
Population	−8.041 (8.686)	0.931* (0.464)
Education	−0.319 (1.467)	−0.725 (0.985)
Political rights	0.329 (0.669)	1.098 (0.707)
Trade openness	0.0451 (0.0312)	−0.0192 (0.0291)
Observations	401	446
Number of countries	38	38

***p < 0.01, **p < 0.05, *p < 0.1.
[1] Robust standard errors in parentheses.

and imprecise. Thus, the study is developed further by using the system GMM estimator, in which the first-differentiated equation and the level equations are jointly estimated.

The system GMM estimates reported here are from the restricted number of lags of the instrument set. This study applies Windmeijer's (2005) two-step robust standard errors correction to the finite sample to correct for the downward bias of the estimated standard error of the GMM estimator. The estimated GMM coefficients reported in Column (2) in Table 5, show that the share of women in parliament is statistically significant, with the magnitude of coefficient (−0.428), confirming the negative relationship between the share of women in parliament and corruption in Asia. This result is consistent with the estimates from the IV fixed-effect regression. Furthermore, the coefficients from the system GMM regression have similar signs to those from the IV fixed-effect estimation.

The coefficient on the lag of corruption shows a statistically significant positive relationship, supporting the argument that the corruption situation in the past has an impact on current corruption; there is a large degree of persistence in the level of corruption across time. Thus, without controlling for this dynamic movement, the estimates are questionable. Finally, GDP per capita and population remain statistically significant with the expected signs, confirming the significance of their being associated with corruption.

Conclusion

This study investigated the relationship between the share of women in national parliament and

the level of corruption using constructed panel data from 38 Asian countries for the period 1997–2015. Learning from existing literature, the study applied both IV fixed effect and system GMM estimators in order to obtain unbiased and efficient results. The main findings from both methods are robust across all specifications and show a negative relationship between the share of women in parliament and the level of corruption, indicating that an increase in women's participation in politics could reduce corruption levels in Asian countries.

The study also included other related factors in the regressions. While political rights, education, and population are positively associated with corruption, trade openness has no relation to it. The results from the first stage IV fixed effects show that the presence of a system of gender quotas leads to an increase in the share of women in parliament in Asia, indicating success for governments that enforced this regulation.

The results from dynamic GMM estimation clearly show that corruption involves both inertia and dynamic movement. To study these issues, the dynamic model estimation will be the appropriate one to capture the situation in a country. The main findings of this study support evidence from the earlier studies of Dollar et al. (2001) and Swamy et al. (2001); these authors suggested that the situation of countries in Asia can be explained by viewing the promotion of women as a major mechanism for alleviating corruption. As a result, any policy supporting the role of women's participation in politics, such as gender quotas, should be encouraged and widely implemented in the region's countries, as it may be viewed as a major tool for advancing women's roles in society.

Finally, this study contributes by exploiting recently available country data and applying new estimation techniques to the analysis of the gender-corruption nexus in Asia. Although this study tries to address the problem of omission of time-invariant country-specific variables by using a constructed panel from each country, the data are not truly 'panel data', but are pooled in the cross-section data of other countries. Thus, there should be careful interpretation of the results presented here as they may be only indicative of the overall picture of the relationships between gender and corruption in the region.

The countries in this region have different characteristics and are in different stages of socio-economic development, as well as having different social and political attitudes towards gender differences. All of these differences make it difficult to make a single policy recommendation. Thus, further research should take into account the disparity and dissimilarity among countries by focusing particularly on smaller areas of Asia, for example, Southeast Asia, South Asia, Central Asia, and expanding on the position of women in the public services, which extend beyond politics and include women in high-ranking public administrations, or local government, or the judiciary.

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