The determinants of corruption at the individual level: evidence from Bosnia-Herzegovina

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ABSTRACT

This article uses data from the National Survey of Citizens' Perceptions in Bosnia-Herzegovina to investigate the determinants of offering a bribe in the form of money, gifts or services to medical personnel, professors, judicial personnel, police officers and public servants. We presented evidence about the spread of corruption in these five sectors of the economy in Bosnia-Herzegovina, and analysed the effects of determinants at the individual level on the likelihood of engaging in bribery. Our results confirmed that specific personal characteristics predicted corrupt behaviour, but results varied across sectors. Logistic regression was used to generate models from which predictions could be made about the likelihood of an individual engaging in corrupt behaviour. Our research shows that corruption is a widespread phenomenon in Bosnia-Herzegovina, and more educated people, people living in urban areas, and individuals with higher incomes are more likely to engage in bribery in several sectors. Measures and policies aimed at reducing corrupt behaviour should be designed in a way that considers the specific characteristics of these individuals.

1. Introduction

Corruption is one of the biggest challenges of the twenty-first century (OECD, 2015), and can affect the investment climate, the effectiveness of public service, the quality of education, and competencies (OECD, 2018). However, as Jiang (2017) notes, the literature does not provide a consistent definition of corruption. This indicates that diverse approaches have been taken to define the concept, leading to different conclusions regarding the antecedents and consequences of corruption. Svensson (2005) states that 'a common definition of public corruption is the misuse of public office for private gain' (p. 20). In this paper, we define corruption as 'behaviour which deviates from the formal duties of a public role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence' (Nye, 1967, p. 419).

Corruption is studied at different levels (Kaffenberger, 2012): cross-country, firm, and micro. In this paper, we focus on corruption at the micro level. Olken and Pande (2012) and Burguet, Ganuza, and Montalvo (2016) have reviewed microeconomic studies related to corruption, and their results indicate that these studies typically utilise game theory and mechanism design in order to explain the behaviour of bribers and bribees. The main empirical challenges involve the measures, determinants and consequences of corruption. Studies at the cross-country level are widespread. In fact, as Svensson (2003) and Reinikka and Svensson (2006) note, research on the determinants of corruption typically takes the form of cross-country analysis that utilises indices of the perception of corruption. Hietikko (2016, p. 17) observes that 'the existing literature on general determinants of corruption at the level of an individual citizen or business is sparse compared to the work on cross-country measures'. Other studies (Islam & Lee, 2016; Razafindrakoto & Roubaud, 2007) also note that studies based on micro-data have been comparatively rare. Our literature review shows that micro-level corruption is measured differently across studies. Further, it identifies a large number of determinants of corruption (age, gender, marital status, household income, educational attainment, type of settlement and region), which vary across contexts.

Bosnia-Herzegovina is divided into two entities, of which one is further divided into ten cantons. This division of the country has enabled the decentralisation of power, and Divjak and Pugh (2008) argue that such governance structures in Bosnia-Herzegovina have facilitated political corruption. In addition to its complex governmental structure, Bosnia-Herzegovina is facing growing challenges in the areas of corruption, migration and unemployment. The intention to emigrate is highest among those who are young, educated and come from low-income households (Efendic, 2016). As Efendic (2016) notes, the Bosnian-Herzegovinian diaspora is among the largest in Europe: 51% of the resident population lives abroad. The unemployment rate is decreasing, but it is still high (35.0% according to administrative data and 18.4% according to the annual Labour Force Survey), with a significant number of workers in the informal sector (European Commission (EC), 2019). The EC's (2019) report shows that corruption is widespread in all sectors of the economy in Bosnia-Herzegovina, affecting health, education, employment and public procurement matters. As such, it remains an issue of concern. Additionally, the report stresses the high public perception of corruption in the civil service, and the lack of 'systemic and consolidated data on the practice of integrity of civil servants, both in terms of questionnaires on self-declarations on civil service integrity and verification of the integrity of the civil service' (EC, 2019, p. 26). In that sense, Bosnia-Herzegovina ' … is at an early stage/has some level of preparation in the fight against corruption' (EC, 2019, p. 42). Corruption in post-conflict Bosnia-Herzegovina remains rampant (Belloni & Strazzari, 2014). Belloni (2019, p. 64) states this explicitly: 'In Bosnia-Herzegovina, it is widely believed, and frequently related to foreign researchers, that even a cleaning job at the university has become a political appointment.' Another example that illustrates the magnitude of the problem is found in the health sector, where a bribe of approximately €125 is needed to receive reasonable health care (Divjak & Pugh, 2008, p.383).

This article focuses on bribery: a form of corruption where a reward is provided to influence the judgement of a person in a position of trust. Our focus is on the supply side of corruption. In order to discover what determines corruption, this paper analyses information obtained from a sample of 3084 individuals in Bosnia and Herzegovina, where 30.55% of respondents explicitly stated that they had been involved in bribery in one or more of five distinct sectors of the economy. The emphasis is on discovering the characteristics of the bribe giver, not of the person collecting the bribe. In particular, the survey used in this research provides information about whether individuals gave a bribe at least once in the form of money, gifts or services to an individual in one of the following categories: doctors, nurses, professors, teachers, judges, court personnel, police officers, politicians, inspectors and government employees. To our knowledge, no prior studies on understanding the determinants of micro-level corruption in the context of Bosnia-Herzegovina were identified. Our aim is to examine whether the same individual characteristics increase the likelihood of bribery across different sectors of an economy. In addition, we will examine which individual characteristics have a statistically significant effect on the absolute number of corruption experiences, a similar variable used by Gutmann, Padovano, and Voigt (2014).

This article is structured as follows: (1) the theoretical background provides an overview of what determines corruption at the individual level; (2) a detailed explanation of data sources, variables and methods; (3) results and discussion and (4) conclusions and limitations.

2. Theoretical background

In the first part of the literature review, we present the most common empirical approaches to measuring corruption at the micro level. Afterwards, we turn our attention to the micro determinants of bribery.

2.1 Measures of corruption

Olken and Pande (2012) elaborate several methods that can estimate the magnitude of corruption: perception-based measures; survey-based measures of bribes; estimates from direct observation; graft estimation by subtraction and estimates from market inference. Similarly, Burguet et al. (2016) provide broader categories for how corruption might be measured: a laboratory experiment on corruption; perceptions; direct measures; and indirect methods. Each method has advantages and disadvantages in its attempt to measure corruption, but the diversity of these methods leads to a heterogeneous estimation of its magnitude (Olken & Pande, 2012). Direct measures are the best approach when observing corruption, but officials are rarely willing to participate in this kind of research (Olken & Pande, 2012). Cross-country studies rely mostly on the perception of corruption, but as Olken (2009) shows, actual corruption does not correlate well with the perception of it. Questionnaires raise similar concerns, especially around the high probability of under-reporting (Burguet et al., 2016). In order to increase trust while reporting corruption, some studies (Svensson, 2003;

Table 1. Examples of dependent variables in the studies of individual-level corruption.

Study	Dependent variable
Swamy et al. (2001)	An individual is not corrupt if he/she says that bribery is never justified; otherwise he/she is considered corrupt
	Mangers (firm-level): 'How frequently do the officials providing the service require unofficial payments? Please answer on a scale of 1 to 7, where 1 = Never, 2 = 1–20% of the time, 3 = 21–40% of the time, 4 = 41–60% of the time, 5 = 61–80% of the time, 6 = 81–99% of the time, and 7 = Always.' (p. 35)
Hunt (2004), Hunt (2007a)	'In some countries, there is a problem of corruption among government or public officials. During 199x, has any government official, for instance a customs officer, a police officer or inspector in your country asked you, or expected you to pay a bribe for his or her services?' (p. 8.)
Deininger and Mpuga (2004)	The direct indicator measuring if the household was required to pay a bribe in the last six months, and if so the amount that was paid.
Torgler and Valev (2006)	For several statements, respondents were supposed to indicate if corrupt behaviour could be justified.
Razafindrakoto and Roubaud (2007)	Reports of individuals indicating direct confrontation with corrupt officials and the extent to which corruption is perceived as widespread.
Mocan (2008)	'During [the past year] has any government official, for instance, a customs officer, police officer or inspector in your own country, asked you or expected you to pay a bribe for his services?' (p. 4)
Hunt and Laszlo (2012)	One adult per household is asked if the official required a bribe or if the respondent felt obliged to bribe.
Hernandez and McGee (2013)	'The question asked whether the respondent believed that accepting a bribe in the course of one's duties was justifiable. Responses were measured on a 10-point Likert scale where 1 is never justifiable and 10 is always justifiable.' (p. 913)
Gutmann et al. (2014)	Corruption perception measures the degree of corruption in twelve types of organisation. Corruption perception represents the mean value of the eight government agency specific perception indicators
Ivlevs and Hinks (2015)	Engagement in bribery is gathered by asking: has '… any member of your household [made] an unofficial payment or gift when using these services over the past 12 months?'
Liu and Peng (2015)	'How much did you or your parents spend on personal connections with the examiners and admissions workers?' (p. 176)

Source: Authors.

Swamy, Knack, Lee & Azfar, 2001) designed the bribery question in a way that it does not implicate respondents. Finally, experiments are difficult to justify, but they reduce endogeneity concerns that might arise. As Armantier and Boly (2011) note, using experiments to understand corruption is rare; only two field experiments were published before 2011. One of these was Cameron, Chaudhuri, Erkal, and Gangadharan's (2009) use of an experimental methodology to analyse corrupt behaviour across four cultures. In this study, a total of 1935 subjects participated in 645 role-playing activities to test their susceptibility to corruption.

Table 1 shows studies relevant to our research. Deininger and Mpuga's (2004) data come from the Uganda National Integrity Survey, which covered 12,190 households. Hunt (2004) and Hunt (2007a, 2007b) used a sample with over 40,000 observations from 34 countries. Mocan (2008) analysed individual and country characteristics to discover what determines corruption in a large sample (55,000 individuals from 30 countries), focussing on individual and country characteristics that could increase the probability of being asked for a bribe. Hunt and Laszlo (2012) used Peruvian household surveys with over 18,000 observations, and the Ugandan Second National Integrity Survey with over 12,000 household respondents. The dependent variable of these studies represents exposure to bribery, typically measured by asking if any government official asked/expected an individual to pay a bribe for services. Ivlevs and

Hinks (2015) studied individual-level determinants of bribing public officials in thirty countries in Central Europe, Eastern Europe, Central Asia and Western Europe, with around 1000 respondents from each country. The dependent variable was measured by asking if any member of the household had made an unofficial payment for one or more of eight types of public service over the past 12 months. Torgler and Valev (2006) used the data from the World Values Survey to analyse micro-data from more than 50 countries, with 1000 individuals in each national representative sample. The dependent variable measures the justifiability of corruption using the ten-scale index. The measure used in the research has a statistically significant correlation with the Transparency International Corruption Perception Index ($r = 0.36$). Razafindrakoto and Roubaud (2007) used micro-level data from 18 sub-Saharan African countries. Exposure to corruption was measured by several variables, including reports of individuals indicating confrontation with corrupt officials, and the extent to which individuals perceived corruption as widespread. Swamy et al. (2001) analysed two samples: (1) individuals from World Values Surveys (18 surveys in 1981; 43 surveys in 1990–1991); and (2) managers from 350 firms in Georgia. Individuals are not considered corrupt if they say that bribery is never justified; otherwise, they are considered to be corrupt. The outcome variable of interest in the case of managers is measured on a scale from one to seven. It explains how often officials providing the service require unofficial payments. Liu and Peng (2015) used only 1541 of the 2,780 questionnaires they collected from art students in 139 colleges across China. Their dependent variable offered five options with which to check how much a respondent's parents spent on personal connections with the employees of colleges. The question was recorded in binary if spending was evident. Gutmann, Padovano, and Voigt (2014) conducted research on 257,375 individual-level observations from 11 countries, with a dependent variable representing corruption perception.

2.2. Determinants of micro-level corruption

This literature review focuses primarily on micro determinants: more precisely what determines corruption at an individual level. The emphasis is on discovering the characteristics of the bribe giver, not of the person collecting the bribe. In other words, to understand the determinants of the willingness to bribe, we analyse the supply side of corruption. After collecting articles, we collated the significant predictors of bribery at an individual level in Table 2.

2.2.1. Age
Age is a significant predictor of bribery. Although these results are difficult to compare as different age group categories are used in different studies, young individuals are generally more likely to engage in bribery (Ivlevs & Hinks, 2015; Hernandez & McGee, 2013). Individuals who are 20–39 years of age are more likely to bribe than older individuals and those younger than 20 (Mocan, 2008). Torgler and Valev's (2006) results show that individuals between 30 and 65 are more likely to justify corruption than respondents younger than 30. Their sample consisted of more than 50 countries, among which the age effect was higher in the regions of Central and

Table 2. Significant predictors of individual-level corruption.

Significant predictor	More likely to engage in bribery, or evidence to the contrary
Age	Individuals who are 20–39 years of age (Mocan, 2008); Individuals who are 30–65 years of age (Torgler & Valev, 2006); Individuals who are 34–45 years of age (Ivlevs & Hinks, 2015); Individuals who are 30–50 years of age reported a higher corruption perception (Gutmann et al., 2014); Younger individuals (Hernandez & McGee, 2013; Hunt, 2004)
Gender	Males (Hernandez & McGee, 2013; Cameron et al., 2009; Mocan, 2008; Razafindrakoto & Roubaud, 2007; Torgler & Valev, 2006; Swamy et al., 2001); Male-headed households (Deininger & Mpuga, 2004); Females reported a higher perception of corruption (Gutmann et al., 2014); No evidence that females engage less in bribery (Liu & Peng, 2015; Ivlevs & Hinks, 2015)
Marital status	Married individuals (Mocan, 2008; Swamy et al., 2001); Single individuals (Torgler & Valev, 2006)
Income	Individuals with a higher income (Mocan, 2008; Ivlevs & Hinks, 2015; Deininger & Mpuga, 2004); The poorest individuals (Islam & Lee, 2016; Razafindrakoto & Roubaud, 2007); Students from middle-income families (Liu & Peng, 2015); Rich individuals are more likely to bribe than poor ones (Hunt & Laszlo, 2012); Richer patients (Hunt, 2007b); Corruption perception falls with an increase in income (Gutmann et al., 2014); No evidence: Economic status and financial satisfaction do not have a statistically significant association with the justifiability of corruption (Torgler & Valev, 2006).
Education	Highly educated individuals (Mocan, 2008; Razafindrakoto & Roubaud, 2007); Individuals with less knowledge about how to report corruption (Deininger & Mpuga, 2004); A less educated head of household, and girls studying at school (Islam & Lee, 2016); No evidence: No statistically significant association of education with the justifiability of corruption (Torgler & Valev, 2006), bribery (Ivlevs & Hinks, 2015), or the perception of corruption (Gutmann et al., 2014)
Large cities	Individuals living in large cities (Mocan, 2008); Individuals living in larger communities (Hunt, 2004); Rural respondents (Deininger & Mpuga, 2004); Individuals in regions with fewer residents of their own age (Hunt, 2004)
Region	The respondent is from a certain region (Torgler & Valev, 2006)
Employment status & occupation	Self-employed or unemployed individuals (Torgler & Valev, 2006); Farmers (Deininger & Mpuga, 2004)
Confidence in public institutions	People with higher confidence in public institutions (Ivlevs & Hinks, 2015); The level of trust between the briber and the corrupt official can, depending on the country, reduce or increase the probability of a bribe being requested (Razafindrakoto & Roubaud, 2007); A high level of trust does not necessarily reduce corruption, but individuals with absolute trust in the accountability of public servants are less likely to bribe (Liu & Peng, 2015)

Source: Authors.

Eastern Europe, the Former Soviet Union, and Latin America. The results of Hernandez and McGee's (2013) study show that 'people tend to become more opposed to bribery as they get older' (p. 913). Similarly, according to Hunt (2004), older people pay fewer bribes because of trust networks. However, age does not have a statistically significant association with corruption in most countries in Razafindrakoto and Roubaud's (2007) study. Gutmann et al. (2014) show that individuals between 30 and 50 report a higher perception of corruption than younger or older individuals, illustrating an inverse U-shape between age and perception. In line with this discussion, our first research question is: Is age consistently associated with a higher probability of bribing in five sectors of the economy?

2.2.2. Gender

In most studies (Cameron et al., 2009; Mocan, 2008; Razafindrakoto & Roubaud, 2007; Swamy et al., 2001; Torgler & Valev, 2006, Deininger & Mpuga, 2004), males

or male-headed households were more likely to engage in or justify bribery. According to Mocan (2008), possible explanations for this include a higher activity level of males in the labour market, which increases the frequency of their contact with government officials. However, Torgler and Valev's (2006) explanation is that men have lower norms regarding bribery. In addition, females report a higher level of corruption perception (Gutmann et al., 2014). However, two studies (Liu & Peng, 2015; Ivlevs & Hinks, 2015) found no evidence that females engage in bribery less than men. Hernandez and McGee (2013) show that men and women justified bribery equally until 2006, but that males have become more inclined to do so since. Although these are country-level data, recent research by Debski and Jetter (2015) shows that the relationship between gender and corruption raises doubts once country-specific unobservable differences in history or culture are acknowledged. In line with this discussion, our second research question is: Is gender consistently associated with a higher probability of bribing in five sectors of the economy?

2.2.3. Marital status

Married individuals are at higher risk of being exposed to bribery compared with single individuals (Mocan, 2008). Mocan (2008) points out that these single individuals 'may have to deal with government rules and regulations less frequently' (p. 8). However, we could argue that this effect is present because of the pressure of their social network (Torgler & Valev, 2006; Tittle, 1980), or because of how marriage modifies the behaviour of individuals in public (Swamy et al., 2001). Torgler and Valev (2006) show contrary results that indicate married people have a lower tolerance for corruption. They explain it by saying married individuals have a higher social norm regarding bribery than other marital statuses. In line with this discussion, our third research question is: Is marital status consistently associated with a higher probability of bribing in five sectors of the economy?

2.2.4. Income

Income is another important predictor of micro-level corruption. Individuals with higher incomes (Mocan, 2008; Ivlevs & Hinks, 2015), rich individuals (Hunt & Laszlo, 2012), affluent households, and households with higher levels of consumption (Deininger & Mpuga, 2004) are more likely to engage in bribery. However, contrary results obtained by Razafindrakoto and Roubaud (2007) show that the poorest individuals are 'more vulnerable and less able to avoid or resist bureaucratic corruption' (p. 14). Similar results were obtained by Islam and Lee (2016). Liu and Peng (2015) found that students from middle-income families were more likely to bribe. However, in Torgler and Valev's (2006) study, economic status and financial satisfaction do not have a statistically significant association with the justifiability of corruption. The underlying explanation for the positive association of higher income with corruption likely relates to this group's higher frequency of interaction with the government (Mocan, 2008). Gutmann et al. (2014) found that corruption perception decreases with an increase in income. At the macro level, richer countries are strongly associated with lower corruption levels (Debski & Jetter, 2015). In line with this discussion,

our fourth research question is: Is household income consistently associated with a higher probability of bribing in five sectors of the economy?

2.2.5. Education

More educated individuals are more likely to engage in bribery (Mocan, 2008; Razafindrakoto & Roubaud, 2007). The underlying explanation for this finding is most likely that highly educated individuals have more frequent interactions with government officials (Mocan, 2008; Razafindrakoto & Roubaud, 2007). However, individuals who are well informed or better integrated into society might be encouraged to envisage corrupt practices that are reported in the media (Razafindrakoto & Roubaud, 2007). Conversely, Torgler and Valev (2006) found no statistically significant association between education and justifiability of corruption, although they expected that educated individuals might be more familiar with, and knowledgeable about, government activities, which might impact their assessment of justifiability of corruption. It was expected that educated individuals might better understand opportunities for corruption, but no evidence was found to support this claim. Similarly, Ivlevs and Hinks (2015) did not find a statistically significant association between education and corruption behaviour, and Gutmann et al. (2014) did not associate education with perception of corruption. Interestingly, individuals with less knowledge about how to report corruption were less likely to take bribes (Deininger & Mpuga, 2004). An educated individual's field of study can be associated with a higher probability of bribing. The study that implemented the experimental design (Cameron et al., 2009) came to the conclusion that individuals who study economics are more likely to accept bribes. However, as Torgler and Valev (2006) point out, the relationship between education and corruption is not clear, as there is an evident lack of empirical studies at the micro level. In line with this discussion, our fifth research question is: Is educational attainment consistently associated with a higher probability of bribing in the five sectors of the economy?

2.2.6. Type of settlement and region

Mocan (2008) concludes that living in a large city might increase opportunities to interact with government officials; living in a large city creates fewer personal interactions. People from larger communities pay more bribes than individuals from smaller communities because individuals from smaller communities can more easily establish trust networks (Hunt, 2004). However, Deininger and Mpuga (2004) conclude that individuals from rural areas are significantly more likely to bribe than those living in urban areas. Torgler and Valev's (2006) results show that individuals living in certain regions can justify corruption more than individuals in other regions, thus concluding that the 'social norm regarding bribery is unambiguously higher in Western Europe, the U.S., and Australia' (p. 9). According to Hunt (2004), individuals living in regions with many residents of their own age pay fewer bribes. In line with this discussion, our sixth research question is: Does the type of settlement (urban/rural) in which an individual lives increase the probability of bribing across the five sectors of the economy? Finally, we wanted to test whether regional differences increased the probability of an individual to bribe.

2.2.7. Other explanatory variables

In the public sector, Gutmann et al.'s (2014) results show that corruption experience impacts an individual's perception of corruption. Torgler and Valev's (2006) results show that self-employed and unemployed individuals are more likely to justify a bribe, while unemployed and retired persons reported lower perception levels than employed individuals (Gutmann et al., 2014). Individuals in certain occupations (such as business people and professionals) are significantly less likely to bribe than farmers (Deininger & Mpuga, 2004). Ethnic minorities are more likely to pay bribes because of their concentration in a specific sector, their higher vulnerability, or even their connection to former political elites (Ivlevs & Hinks, 2015). Liu and Peng (2015) conclude that personal characteristics influence the willingness to bribe. Their study identifies several important predictors of bribery: the perceived level of corruption; personal attitudes towards corruption; academic attainment; and the rank of a college. An interesting explanatory variable that has been shown to increase the risk of an individual being asked to bribe is the lack of knowledge about the procedures for reporting corruption (Deininger & Mpuga, 2004). This indicates the focus of corruption prevention should be on improved accountability. Significantly, Hunt (2007a) found that 'victims of misfortune, particularly crime victims, are much more likely than non-victims to bribe public officials' (p. 2).

3. Data and models

This article uses the National Survey of Citizens' Perceptions of Bosnia and Herzegovina (NSCP-BiH). The third round of the NSCP-BiH was financed by USAID/BiH and was conducted in 2017 by IMPAQ International, under the Monitoring and Evaluation Support Activity (MEASURE-BIH). The sampling was based on probability or representative sampling, ensuring a nationally representative sample. The response rate for NSCP-BiH 2017 was 64%. A total of 3084 responses from individuals older than 18 years were collected in a face-to-face computer-assisted personal interviewing survey. As such, this sample is nationally representative and sufficiently large. This section provides a detailed explanation of variables employed in modelling, sampling characteristics, and techniques used for data analysis.

Table 3 presents the characteristics of the entire sample. Women are slightly over-represented in the sample (56.06% of the total sample size). The largest group comprises individuals older than 55 years (34.86%), while respondents in other age groups are equally distributed. Most survey participants were married (59.08%), with single individuals representing 26.13% of the total sample. Secondary education was the most frequent level of education completed by survey participants (59.34%), followed by primary education (24.71%). The representation of respondents in the three major ethnic groups was: Bosniaks (55.12%), Serbs (32.49%) and Croats (8.95%). About 73% of the data concerning the occupation of individuals is missing. The most common occupations recorded were those in services and retail (6.00% of the total sample size), and elementary occupations (4.47%). Most survey participants reported the monthly net income of their household to be below 500 BAM (21.98% of the total sample), or between 500 and 1000 BAM (21.73% of the total sample).

Table 3. Sample characteristics.

		Frequency	Percentage (% of total)
Total	Total sample size	**3084**	**100.00**
Gender	Male	1355	43.9
	Female	1729	56.1
Age	18–24	459	14.9
	25–34	582	18.9
	35–44	465	15.1
	45–54	503	16.3
	55+	1075	34.9
Marital status	Single	806	26.1
	Married	1822	59.1
	Divorced, widower or in a cohabiting partnership	456	14.8
The highest level of education completed	Less than secondary education	762	24.7
	Secondary education	1830	59.3
	More than secondary education	492	16.0
Ethnicity	Bosniak	1700	55.1
	Croat	276	9.0
	Serb	1002	32.5
	Other, Did not declare, or Missing	106	3.4
Current occupation	Legislators, senior officials and chief executives	18	0.6
	Scientists, engineers and other professionals	108	3.5
	Technicians and associate professionals	122	4.0
	Clerical support workers	96	3.1
	Service and sales workers	185	6.0
	Skilled agricultural, forestry and fishery workers	10	0.3
	Craft and related trades workers	62	2.0
	Plant and machine operators and assemblers	71	2.3
	Elementary occupations	138	4.5
	Armed forces occupations	14	0.5
	Does not know/Refuses to answer	185	6.0
	Missing	2075	67.3
Monthly net income of household	No income in this month	87	2.8
	1–500 BAM	591	19.2
	501–1000 BAM	670	21.7
	>1000 BAM	388	12.6
	Does not know/Refuses to answer	1348	43.7

Source: Authors.

The proportion of respondents who have given bribes is presented in Table 4. Based on these results, we can observe the following: (a) women were less likely than men to give a bribe; (b) the likelihood of giving a bribe increased with age (excluding participants above 55 years), and in households with a higher monthly net income; (c) married individuals were more likely to give a bribe than single and divorced individuals; (d) survey participants with secondary education were more likely to give a bribe than those with a lower or higher level of education; and (e) Serbs were more likely to report giving a bribe than Bosniaks and Croats, and Croats were more likely to report giving a bribe than Bosniaks. Technicians, associate professionals, legislators, senior officials and chief executives were the occupations with the highest occurrences of bribery (over 40% of the total number of respondents in the corresponding occupation). Additional analyses show that there are differences in a respondent's age, marital status, monthly net household income and level of education that can indicate whether or not they have ever given a bribe. Therefore, these variables might be significant predictors of corruption.

Table 4. Have you ever given money, gifts, services or similar in exchange for better treatment?.

		Frequency	Percentage (% of total)
	Total number of respondents who gave at least one type of bribe	939	30.5
Gender	Male	454	33.5
	Female	485	28.1
Age	18–24	105	22.9
	25–34	180	30.9
	35–44	152	32.7
	45–54	174	34.6
	55+	328	30.5
Marital status	Single	214	26.6
	Married	585	32.1
	Divorced, widower/Widow or in a cohabiting partnership	140	30.7
The highest level of education completed	Less than secondary education	207	27.2
	Secondary education	598	32.7
	More than secondary education	134	27.2
Ethnicity	Bosniak	488	28.7
	Croat	86	31.2
	Serb	331	33.0
	Other or Did not declare	34	32.1
Current occupation	Legislators, senior officials and chief executives	8	44.4
	Scientists, engineers and other professionals	30	27.8
	Technicians and associate professionals	60	49.2
	Clerical support workers	28	29.2
	Service and sales workers	66	35.7
	Skilled agricultural, forestry and fishery workers	2	20.0
	Craft and related trades workers	23	37.1
	Plant and machine operators and assemblers	25	35.2
	Elementary occupations	48	34.8
	Armed forces occupations	5	35.7
	Does not know/Refuses to answer	43	23.2
	Missing	601	29.0
Monthly net income of household	No income in this month	23	26.4
	1–500 BAM	162	27.4
	501–1000 BAM	215	32.1
	>1000 BAM	157	40.5
	Does not know/Refuses to answer	382	28.3

Source: Authors.

Due to large amounts of missing data in each occupation category (only 32% respondents of the sample were employed, or 59% when students and retired persons were excluded), the occupational variable is not included in our models. We ran several logistic regression models with a series of occupational dummies, but this resulted in a large amount of missing data in all models. For this reason, we proceeded without this variable.

We specified six models. In the first five, our dependent variable has the value 'one' if the respondent had to give money, gifts, services, or similar in exchange for better treatment from an employee in one of the following categories: medical personnel, teachers, judicial personnel, police officers, or public servants. Bribes were mainly given to doctors (26.9%), followed by nurses (23.1%) and police officers (16.8%). The other two types of bribery are less common, and their occurrences are below 4% of respondents in the sample (Table 5). The correlation between a bribe given to a doctor and that given to a nurse is very strong ($r = 0.726$, $p < 0.05$), suggesting that interaction with doctors might also require interaction with nurses.

Table 5. Dependent variables.

	Have you ever given money, gifts, services, or similar to any of the following in exchange for better treatment?		
	Yes	No	Does not know
Medical personnel	**918 (29.8%)**	**2006 (65.1%)**	**160[a] (5.2%)**
Doctors	831 (26.9%)	2124 (68.9%)	129 (4.2%)
Nurses	711 (23.1%)	2228 (72.2%)	145 (4.7%)
Teachers	**109 (3.5%)**	**2818 (91.4%)**	**157 (5.1%)**
Judicial personnel	**132 (4.3%)**	**2777 (90.1%)**	**175 (5.7%)**
Judges/prosecutors	92 (3.0%)	2837 (92.0%)	155 (5.0%)
Court personnel	90 (2.9%)	2842 (92.2%)	152 (4.9%)
Police officers	**517 (16.8%)**	**2416 (78.3%)**	**151 (4.9%)**
Public servants	**308 (10.0%)**	**2584 (83.8%)**	**192 (6.2%)**
Politicians	94 (3.0%)	2859 (92.7%)	131 (4.2%)
Inspectors	123 (4.0%)	2825 (91.6%)	136 (4.4%)
Government employees	82 (2.7%)	2859 (92.7%)	143 (4.6%)
Other public officials	209 (6.8%)	2731 (88.6%)	144 (4.7%)

Source: Authors.
[a]The larger number of respondents in the aggregated category than in subcategories is due to missing data: if a respondent indicated that they had never given a bribe to a doctor, but did not answer the question about bribing a nurse, we could not claim that this respondent fell within the two previous categories.

There is a moderate positive linear relationship between bribes given to the following groups in the sample: politician and inspector ($r = 0.626$, $p < 0.05$); politician and government employee ($r = 0.590$, $p < 0.05$); and inspector and government employee ($r = 0.551$, $p < 0.05$). These categories represent a similar broader group (public servants), indicating that individuals who interact with one group might also need to interact with another. Respondents involved in giving a bribe to politicians might have a higher probability of interacting with and bribing inspectors and government employees. Finally, the correlation between judge/prosecutor and court personnel is moderately strong ($r = 0.58$, $p < 0.05$). In order to improve the predictability of our models, we aggregated these ten types of bribe into five categories, as shown in Table 5.

In the sixth model, the dependent variable represents the absolute number of corruption experiences. A similar approach to capture corruption experience was used by Gutmann et al. (2014). In our case, corruption experience measures the number of sectors in which an individual was involved in bribery. For example, if an individual was involved in bribing teachers and police officers, the absolute number of corruption experiences is two. There were 436 missing data (14.1%) because these participants did not answer the question about their involvement in some form of corruption. A total of 1709 respondents (55.4%) did not participate in bribery at all. However, 939 individuals (30.45%) provided gifts or money to the previously identified categories of bribe-takers. About 2% of respondents were involved in more than five types of bribery.

Starting with the predictors of corruption identified in the literature, we outlined a list of variables in our models (Table 6). We included demographic variables for which most of the data were not missing.

Logistic regression is used to generate models from which predictions can be made about the likelihood of an individual to give bribes. We used STATA 15.1 to fit a

Table 6. Model specifications.

Model	Outcome variable: Have you ever given money, gifts, services, or similar to any of the following in exchange for better treatment?	Explanatory variables
Model 1	**Medical personnel (Yes/No)** Doctors (Yes/No) Nurses (Yes/No)	**Age (years)** **Gender (=1 if Male)**
Model 2	**Teachers (Yes/No)** Teaching staff at primary or secondary schools, or at universities (Yes/No)	**Marital status:** Single (ref.), Married, Divorced, Widower (=1 if Yes)
Model 3	**Judicial personnel (Yes/No)** Judges/prosecutors (Yes/No) Court personnel (Yes/No)	**Monthly net household income:** Low (0–500 BAM), Middle (501–1000 BAM), High (>1000)
Model 4	**Police officers (Yes/No)** Police officers (Yes/No)	**Level of Education:**
Model 5	**Public servants (Yes/No)** Politicians (Yes/No) Inspectors (Yes/No) Government employees (Yes/No) Other public officials (Yes/No)	No education (ref.) Primary education or less Secondary education Post-secondary education University/Further education
Model 6	**Corruption Experience**	**Region characteristics:** Rural settlement & 13 regions (dummies)

Source: Authors.

logit model with a binary outcome variable (maximum-likelihood estimation). We reported the odds ratio Exp(B) to show the change in odds that results from a unit change in the variable of interest. The odds ratio provides a more intuitive way to interpret effects. Collinearity diagnostics were performed to detect potential issues with multicollinearity. All variance inflation factors (VIF) values were below five, and all tolerance levels above 0.2, suggesting no issues with multicollinearity. In Table 7, we reported the mean VIF values for our models. In order to test how well our models fit the data, we used the Hosmer–Lemeshow goodness of fit test. The test indicated that all logistic regression models, except Model 3 (Judicial personnel), fit the data well. The model fit in Model 3 was significantly improved after removing regional dummies (cantons), but as we did not observe any changes in the coefficients we presented the original model with regional dummies. However, the results of Model 3 should be interpreted with caution.

4. Results

Since the parameters in each case have different meanings in terms of magnitude, we first presented the means of dependent variables. The most frequent form of corruption is that of bribing medical personnel: almost 30% of survey participants reported that they had done this. A small percentage of individuals had bribed teachers (3.5%) and judicial personnel (4.3%). Incidences of corruption in other sectors lie between these boundaries. Almost 17% of survey participants reported that they had bribed a police officer, and 10% reported that they had bribed a public servant. In comparison, the study in Uganda (Deininger & Mpuga, 2004) reported that law enforcement is the most corrupted sector (36% users had paid bribes), followed by the health sector (21%), local administration (15%) and education (7%). In both contexts, bribery in

Table 7. Overview of results.

		Odds Ratio					Coefficients
Explanatory variable		Model 1 Medical personnel	Model 2 Teachers	Model 3 Judicial personnel	Model 4 Police officers	Model 5 Public servants	Model 6 Corruption Experience
Age							
Reference group							
18–24	25–34	1.19	0.75	0.64	1.02	1.09	0.05
	35–44	1.33	0.44	1.10	0.95	1.52	0.09
	45–54	1.38	0.67	1.18	1.15	1.34	0.13
	55+	1.33	0.26**	0.97	0.83	1.15	0.02
Gender	Male (=1 if male)	1.01	1.22	1.29	2.46***	1.18	**0.19*****
Marital status							
Reference category:							
Single	Married	0.96	1.00	0.52*	0.73	0.77	−0.11
	Divorced	1.18	1.28	0.96	1.20	1.40	0.13
	Widower	0.87	0.67	0.43	0.38***	0.57	−0.19
Household Income							
Reference category:							
Low income (0–500)	Middle income (501–1000)	1.18	0.98	1.09	1.29	1.21	0.07
	High income (>1000)	1.67***	1.03	1.23	2.07***	1.51*	**0.33*****
Education							
Reference category:							
No education (Model 1, 3, 4, 5 and 6)	Primary education or less	1.75**	(Ref.)	2.75	3.38***	3.69**	0.15
and Primary education (Model 2)	Secondary education	1.68***	1.55	3.64	4.35***	6.23***	**0.23****
	Post-secondary education	1.45	1.36	4.02	3.26***	7.16***	0.19
	University/Further education	1.52	1.75	3.70	2.75***	7.18***	0.2
Rural	=1 if living in a rural area	0.83	0.55**	0.39***	0.63***	0.57***	**−0.16*****
Region							
Reference category:							
Una-Sana Canton	Tuzla Canton	0.69	0.73	0.61	0.45***	1.02	**−0.2***
	Zenica-Doboj Canton	0.91	0.81	2.24	0.38***	1.45	−0.17
	Central Bosnia Canton	1.15	((empty)	0.49	0.38***	0.26**	**−0.27***
	Herzegovina-Neretva Canton	1.69	6.78***	16.33***	1.82	8.55***	**0.67*****
	West Herzegovina Canton	((empty)	3.08	48.88***	1.05	31.37***	**2.15*****
	Sarajevo Canton	1.00	1.39	1.21	0.46***	2.36**	−0.02
	Livno Canton	0.56	((empty)	((empty)	((empty)	((empty)	−0.46
	Republika Srpska (North)	0.82	0.51	0.51	0.64*	0.74	−0.14
	Republika Srpska (East)	0.66**	0.38*	1.95	0.56**	1.54	−0.02
	Posavina Canton	1.44	1.15	((empty)	0.98	1.15	0.07
	Bosnian-Podrinje Canton	0.49	((empty)	((empty)	((empty)	((empty)	**−0.85****
	Brcko District	((empty)	((empty)	((empty)	((empty)	1.66	−0.77
Constant		0.26	0.08	0.02	0.09	0.02	**0.52*****
(Pseudo) R²		2%	11%	17%	12%	12%	7%
N		1662	1363	1619	1663	1642	1,536
Hosmer-Lemeshow chi²(8)		3.43	5.62	16.68**	6.20	12.29	/
Prob > chi²		0.91	0.69	0.03	0.62	0.14	/
Mean VIF		2.10	2.11	2.11	2.11	2.13	2.15

Source: Authors.
***Significant at 0.01 level.
**Significant at 0.05 level.
*Significant at 0.10 level.

the education sector is relatively low, and the spread of bribing in the health sector is similar. A study based on data from 34 countries (Hunt, 2004) reported higher rates of bribery than those in Bosnia-Herzegovina: 12% of respondents had paid a bribe to a public official; 24% to a government official; and 34% to a police officer.

In Table 5, we present the coefficients and their significance values in six models for the purpose of comparing results across sectors. Only individuals who answered 'Yes' or 'No' to each question regarding involvement in corruption are included in the analysis. Individuals that did not answer, or did not know the answer, were excluded as we cannot know for sure that they participated in bribery.

We reported (pseudo) R^2 as it is the STATA's default output. However, measuring the overall fit in logistic regression is not as straightforward as in linear regression (Studenmund, 2016). Field (2009, p. 269) states that there is controversy regarding an adequate analogue to the R^2 when using logistic regression. Razafindrakoto and Roubaud (2007) reported a relatively low pseudo R^2 for some of their models with a low R^2 (below 12%). Swamy et al. (2001) reported their pseudo R^2 to be 16.5%, whereas Hunt and Laszlo (2012) reported it in a range from 4% to 31%. Other studies have reported a relatively low R^2: between 20% and 25% (Ivlevs & Hinks, 2015) and between 9% and 17% (Hunt, 2004). However, yet other studies (Deininger & Mpuga, 2004; Torgler & Valev, 2006; Mocan, 2008; Liu & Peng, 2015) do not report a pseudo R^2, but rather a log-likelihood.

4.1. Age

A statistically significant association between a respondent's age and engagement in bribery exists only in cases of bribing teachers/professors. On average, odds for respondents older than 55 years are 74% lower than those for respondents in the 18–24 age group. We found no statistically significant association between the other three age groups and the bribing of teachers. We also employed age as a continuous variable, and found that with each year of increase in a respondent's age, there was an approximately 3% decrease in the odds of them bribing teachers/professors. The age of the respondent was not a significant predictor of bribery within other sectors of the economy.

4.2. Gender and marital status

Overall, gender and marital status did not have a statistically significant association with bribing in most sectors of the economy. However, gender and one marital status (widower) were found to have a statistically significant association with bribing police officers. The odds that males will engage in bribing police officers are 146% higher than those for females. This is in line with most studies of determinants of micro-level corruption (Cameron et al., 2009; Mocan, 2008; Razafindrakoto & Roubaud, 2007; Torgler & Valev, 2006; Deininger & Mpuga, 2004; Swamy et al., 2001): males or male-headed households are more likely to engage in or justify bribery. Odds for widowers are 62% lower than those for singles. We also found that marital status has a significant effect on the bribery of judicial personnel. The

odds for married individuals are 48% lower than those for singles, but are still significant at 10%. The literature contains mixed results; our results are in line with Torgler and Valev's (2006) results, but contradict those of Mocan (2008). In our Model 6, involvement in various bribing activities was higher for male than female respondents.

4.3. Household income

Respondents with a higher income (more than 1000 BAM/month) are significantly more likely to engage in bribing in three out of five bribery categories than respondents in the low-income group. On average, the odds that respondents with a high income will engage in bribing medical personnel, police officers and public servants are 67, 107, and 51% higher than the odds for respondents with a low income, respectively. Belonging to a middle-income household has no statistically significant association with bribing of any type. In Model 6, high income has statistically significant influences on corruption experiences, indicating that they will be higher for respondents with a high income than for those with a low one.

4.4. Education

A statistically significant association between some levels of education and the bribing of officials are found in three out of five models. In terms of the percentage change in those models, we found that the odds that respondents with higher levels of education will engage in bribing activities are higher than those for respondents with no education at all. The odds that respondents with a primary education will offer bribes to medical personnel, police officers and public servants are 75, 238 and 269% higher than those for respondents with no education, respectively. Similarly, the odds that respondents with secondary education will offer bribes to the same bribe-takers are 68, 335 and 523% higher than those for respondents with no education, respectively. The odds for respondents with post-secondary education are higher than those of our reference group in only two categories of bribe-taker: police officers (226% higher, but significant at 10%), and public servants (618% higher). Finally, respondents with university degrees have higher odds for bribing police officers (175% higher, significant at 10%) and public servants (618% higher, significant at 10%). In our sixth Model, only secondary education has a statistically positive effect on corruption experience, indicating that the latter is higher for respondents with secondary education than for those with only primary education.

4.5. Type of settlement and regions

Respondents from rural areas were significantly less likely to offer a bribe to teachers, judicial personnel, police officers and public servants than participants from an urban area. The odds of engaging in these bribe categories if respondents are from rural areas are between 27% and 61% lower than those for respondents from an urban area. Respondents from Herzegovina-Neretva Canton and West Herzegovina Canton

were found to engage significantly more in bribery activities in several sectors than those from the reference group (Una-Sana Canton). The odds ratios for these two cantons are unusually high compared to other odds ratios. In addition, we observed that the odds of respondents bribing police officers in 6 out of the 12 regions were lower than those for respondents from our reference region. In Model 6, we identified five cantons with a significant influence on the dependent variable: Tuzla Canton, Central Bosnia Canton, Herzegovina-Neretva Canton, West Herzegovina Canton, and Bosnian-Podrinje Canton. We can say that corruption experience will be higher for respondents from Herzegovina-Neretva Canton and West Herzegovina Canton than for those from Una-Sana Canton. On the other hand, corruption experience is lower for respondents from Tuzla, Central Bosnia and Bosnian-Podrinje Cantons.

5. Discussion

In this article, we aimed to analyse the consistency of predictors of bribery across sectors. We found several statistically significant but inconsistent predictors in five sectors: health, education, justice, police, and government. We also presented the important predictors of corruption experience: that is, overall involvement in different forms of bribery. Our models show that income, education and type of settlement play an important role in predicting corrupt behaviour at the individual level, but only in several sectors. Additionally, gender is an important predictor of corruption experiences.

Understanding corruption and its potential predictors are essential in order to better support anti-corruption policies. Jancsics (2019, p. 2) argues that more effective anti-corruption strategies can be developed if 'we specify exactly what we understand about different types of corruption'. In essence, our five forms of bribery are cases of need corruption: an individual decides to bribe in order to receive appropriate services or to avoid hassle. However, inconsistent results across sectors support the fact that although need corruption is common to all individuals regardless of their socio-demographic characteristics, a certain individual's characteristics can increase or decrease the probability of bribery. Hence, significant predictors can determine an individual's state in terms of age, gender, education level or income, when the need to bribe in exchange for services is more likely to occur.

Corruption is a worrying (EC, 2019) and widespread (Belloni, 2019) problem in Bosnia-Herzegovina. As in Bulgaria, the high involvement in corruption of individuals in different sectors of Bosnia-Herzegovina's economy may indicate that 'the corruption does not violate social norms but has rather become the norm itself' (Pavlovska-Hilaiel, 2015, p. 204). Plaček, Půček, and Ochrana (2019) argue that factors specific to post-communist countries might be important in understanding corruption; that is, bribing officials had been a way to satisfy the needs of an individual in times of scarcity, both on the demand and supply sides of corruption. Such corrupt behaviour is still 'deeply rooted in the consciousness of the citizens of post-communist countries' (Plaček, Půček, & Ochrana, 2019, p. 13). In line with this, we argue that corruption is an inherited lifestyle in Bosnia-Herzegovina, regardless of age, marital status or gender in most sectors of the economy, although having a

higher income and higher level of education increases the probability of bribery in several sectors.

Nevertheless, it is worth discussing several statistically significant predictors of bribery. Type of settlement is the most consistent predictor across sectors, indicating that people living in urban areas are more likely to bribe teachers, judicial personnel, police officers and public servants, and to have a higher corruption experience. As Hunt (2004) notes, people from larger communities pay more bribes than those from smaller ones, because it is easier for individuals in smaller communities to establish trust networks. Additionally, living in a large city can increase an individual's likelihood to interact with government officials (Mocan, 2008). We argue that both trust networks and an increased need for interactions with government officials are important in understanding our results. However, no significant results were obtained regarding the bribing of medical personnel. This might indicate that bribing medical personnel demonstrates the prevalence of need corruption in both rural and urban areas, since individuals are expected to bribe to receive adequate health care (Divjak & Pugh, 2008). The same reasoning applies to other sectors, but individuals from rural areas have a lower need for such interventions due to established trust networks.

Education and income are found to be important predictors of corruption in three sectors. Secondary education and high income are positively associated with corruption experience. Our results regarding education are in line with those of Mocan (2008) and Razafindrakoto and Roubaud (2007), and suggest that more educated individuals are more likely to engage in bribery. In terms of high income, our results are in line with those of previous studies (Mocan, 2008; Ivlevs & Hinks, 2015; Hunt & Laszlo, 2012; Deininger & Mpuga, 2004). As all these corrupted practices are cases of need corruption, an individual with a higher education or higher income bribes to receive appropriate services. As Torgler and Valev (2006) note, more educated people can better assess the justifiability of corruption, which leads to a higher engagement in bribery activities. However, Mocan (2008) argues that more educated individuals and individuals with higher incomes interact with officials more often. As the illegal act of bribing is more likely to be enacted by educated individuals and individuals with a higher income, policy-makers should address this issue according to the socio-demographic specificities of these categories. However, such discussion is beyond the scope of this article.

Gender, marital status and age were found to be statistically significant predictors of corruption in only one sector each: the oldest individuals are less involved in bribing teachers; males are more involved in bribing police officers, and are more likely to have a higher corruption experience; and widowers are less involved in bribing police officers. In line with Mocan (2008), males are more active outside the home. As expected, in Bosnia-Herzegovina males are more likely to drive a car, but they also refuse to wear a seat belt more frequently than females (Lipovac, Tešić, Marić, & Đerić, 2015). Hence, they are more often in a situation in which they need to bribe police officers in order to avoid sanctions or paying larger fines. Finally, similarly to those of Razafindrakoto and Roubaud (2007), our results could not associate age with a higher likelihood of bribing in most sectors, indicating that corruption is a widespread problem regardless of age.

6. Conclusion

This study analyses the determinants of micro-level corruption in Bosnia-Herzegovina. Accordingly, we presented evidence about the spread of corruption in five sectors of the country's economy. Further, we analysed the effects of determinants at the individual level on the likelihood of engaging in bribery. Our results confirm that specific personal characteristics predict corrupt behaviour, but results vary across sectors. These inconsistencies support the fact that need corruption is common to all individuals regardless of their socio-demographic characteristics, although a particular individual's characteristics can increase or decrease the probability of bribery. We found several statistically significant predictors in the following sectors of the economy: medical personnel (income, education); teachers (age, rural settlement); judicial personnel (married, rural settlement); police officers (gender, widower, income, education, rural settlement) and public servants (income, education, rural settlement). Gender, income, education and rural settlement are associated with corruption experiences. Overall, our models show that income, education and type of settlement play an important role in predicting corrupt behaviour at the individual level.

The study of determinants of micro-level corruption in the context of Bosnia-Herzegovina, a country that is facing growing challenges in the areas of corruption, migration and unemployment, is of particular importance. We contribute to the growing body of research within correlation theories: that is, to the limited number of studies of micro-level determinants of corruption (Islam & Lee, 2016; Hietikko, 2016; Razafindrakoto & Roubaud, 2007). In order to make anti-corruption measures more effective, policy responses should target particular types of corruption, as 'the public administration literature has made little effort to explore such corruption types' (Jancsics, 2019, p. 2). Jancsics (2019) argues that a common understanding of different types of corruption might help to develop more effective anti-corruption strategies. In that sense, our paper contributes to the body of knowledge by examining the consistency of determinants of five forms of petty corruption: that is, corruption based on its location within different sectors of the economy. We also contribute by analysing the relationship between the socio-demographic characteristics of an individual and corruption experience.

Our research shows that corruption is a widespread phenomenon in Bosnia-Herzegovina, with more educated people, people living in urban areas, and individuals with a higher income more likely to engage in bribery in several sectors. Measures and policies aimed at reducing corrupt behaviour should be designed in a way that considers the specific characteristics of these individuals. Diverse approaches may be required for individuals with different socio-demographic characteristics, in order to reduce the magnitude of micro-level corruption.

There were a few limitations to our study: we did not participate in the conceptualisation and design of the survey, which meant that our dependent variable was defined in a way that might implicate respondents. This may have caused an underestimation of the incidence of bribery. However, Measure BiH ensured that the data collection process was conducted at the highest standard. It is worth noting that only 4–5% of respondents in each category did not answer the question about their

involvement in corruption. However, it is possible that some forms of corruption (such as giving gifts to doctors) were not directly reported as they might not have been perceived as corruption by the client. Finally, due to a large amount of missing data in each occupation category, we were unable to include occupational variables in our models. This may have left us without an important predictor of bribery.

Further research is required in order to understand the consequences of bribing in these five sectors of the economy, and future papers should consider including a variety of explanatory variables. Interaction terms should be included in models to test if the effect of one variable depends on the value of another. Longitudinal studies would be especially useful. As corruption is so widespread, researchers should try to evaluate the impact of existing policies and measures in place to reduce it.

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