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Global economic crisis and corruption experience: Evidence from transition economies

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Abstract

The wider effects of the 2008-2009 global economic crisis are currently underexplored. We fill this gap by studying the effects of the crisis on household corruption experience in 30 transition economies. We find that households hit by crisis are more likely to bribe public officials. Among bribe givers, the crisis victims are more likely to pay bribes because public officials ask them to do so. Our findings support the conjecture that the crisis increased people's vulnerability, which, in turn, was exploited by public officials.

Keywords: corruption, global economic crisis, transition economies.

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1. Introduction

Few people doubt that adverse macroeconomic shocks have a profound effect on the material, psychological and physical well-being of people. Job loss, salary reduction, business bankruptcy or falling remittances introduce uncertainty and make people insecure and vulnerable, which in turn can influence different aspects of their behaviour. The 2008-2009 global economic crisis is no exception: recent empirical contributions have shown that the crisis was associated with a deterioration in people's mental health (Katikireddi et al. 2012), mood, anxiety and alcohol-related disorders (Gili et al. 2013), a higher probability of committing suicide (Barr et al. 2012), falling birth rates (Sobotka et al. 2011), as well as lower trust in national and supranational institutions (Roth et al. 2011). This literature, however, is in its infancy – many wider insidious effects of the crisis remain underexplored or unobserved.

In this paper, we explore whether crisis can also contribute to the incidence of bribery. We argue that the victims of the economic crisis are more likely to engage in corrupt exchanges than the non-victims, for the following reasons. The first is that people hit by an adverse income shock may be more likely to pay bribes to public officials because they are more likely to contact public officials in the first place. Such more frequent contacts with public officials can increase bribery indirectly.³

Secondly, among all those people who contact public officials, crisis victims may end up paying bribes more frequently than the non-victims because the stress of the change in circumstances makes them more vulnerable to abuse by public officials. Crisis victims may also need to reveal their financial position to public officials in order to access public services and this information can trigger extortion. Alternatively, crisis victims may be willing to pay bribes to public officials to get the service quicker or make sure it is of higher quality.⁴

We test these hypotheses using data on household-level corruption experience in 30 transition economies. We find that the victims of the global economic crisis are more likely to contact

³ Eliminating such preconditions for corruption is one of the reasons why many countries across the world are introducing e-governance – electronic provision of public services which excludes contact with public officials (Pathak et al., 2008; Mistry and Jalal, 2012)..

⁴ Hunt (2007) uses similar arguments to explain why the victims of different misfortunes – crime, job loss, death of income earner, sudden illness, family shop bankruptcy or a natural disaster – are more likely to contact public officials and pay bribes, conditional on official use.

public officials and also to pay bribes, once the contact has taken place. Among bribe-givers, crisis victims are less likely to make unofficial gifts or payments out of gratitude and more likely because they are asked to do so by public officials. This supports the idea that public officials abuse the vulnerability of crisis victims. We also find that the link between crisis and corruption is strongest in the poorest and most corrupt countries of the post-socialist world.

Our study makes a number of contributions to the existing literature. First, we contribute to the expanding literature on the micro-determinants of corruption and, in particular, to the links between income and bribery. Several micro-level studies have shown that richer people are more likely to pay bribes (Guerrero and Rodriguez-Oreggia 2008), contact public officials and pay bribes conditional on public official use (Hunt and Lazslo 2011), be asked for bribes by public officials (Mocan 2008) and find corrupt behaviour justifiable (Gatti et al. 2003). At the same time, Hunt and Lazslo (2012) find that, among bribers, the poor pay a greater proportion of their incomes than the rich, and Hunt (2007) finds that victims of misfortunes, such as crime, job loss, shop bankruptcy or death of earner, are more likely to contact public officials and be involved in bribery, once the contact with public officials has taken place. These studies point to a complex individual-level relationship between income (or other manifestations of material well-being, such as wealth and earnings) and corruption; we contribute to this debate by studying the link between the crisis-induced adverse economic welfare shocks and corruption.

Secondly, we use a large and as yet unexplored survey, administered in 30 economies of Central and Eastern Europe and Central Asia. An important advantage of the data is that the respondents were asked about their actual corruption experience – paying a bribe to a public official.⁵ Much of the previous literature on the micro-determinants of corruption has concentrated on attitudes towards corruption (Soot and Rootalu 2012, Gatti et al. 2003, Truex 2011) and the probability of being asked for a bribe (Mocan 2008). Several studies (Tavits 2010, Hunt and Laszlo 2012, Hunt 2007, Guerrero and Rodriguez-Oreggia 2008) have addressed the actual bribing behaviour, but only in the context of one or two countries (such

⁵ On the downside, the respondents may be reluctant to talk about the actual corruption exchanges in which they were involved. However, the stigma associated with answering honestly questions about bribery may be lower in high-corruption (such as transition economies) than low-corruption countries (such as industrialised Western democracies). This is because in high-corruption countries bribery is viewed as inevitable and part of the system (Hunt 2007).

as Estonia, Peru, Uganda or Mexico). To the best of our knowledge, this is the first study to focus on a direct measure of corrupt behaviour – paying a bribe – in a multi-country setting. In addition to the information on actual corruption experience, the survey also contains information on *why* people pay bribes. This allows us to test whether crisis victims are more likely to be an extortion target of public officials.

Finally, we view bribery as a unified two-stage process, consisting of selection into contact with public officials in the first stage, and committing bribery, conditional on contact with public officials. In a related work, Ivlevs and Hinks (2013) show that a failure to control for selection into contact with public officials may result in biased estimates of socio-demographic characteristics in explaining individual bribing behaviour. In the context of a wider literature, our work is closest to Hunt and Laszlo (2012) and Hunt (2007), who also look at both the selection into contact with public officials and bribery conditional on contact, but do not empirically analyse the two processes in a unified framework.

The remainder of the paper is structured as follows. Section two presents data and variables, and section three presents descriptive statistics. Section four discusses the estimation strategy. Section five reports and discusses the results. Section six concludes.

2. Data, variables and descriptive statistics.

2.1. Data.

The data for this study come from the “Life in Transition 2” survey, conducted by the EBRD and the World Bank in autumn 2010. The survey contains nationally representative samples of either 1,000 or 1,500 respondents in 30 post-socialist countries in Central and Eastern Europe and Central Asia, and five Western European countries (France, Germany, Italy, Sweden and the UK). We exclude the five Western European countries from our analysis, as, in many respects, they represent a qualitatively different group from the post-socialist countries. With longer histories of democracy and transparency, corruption in Western European countries is less of an issue compared with Central Eastern Europe and Central Asia. Partly because of this, admitting involvement in corrupt exchanges carries a higher stigma, and therefore is less common, in Western countries compared with transition and

developing countries, where corruption is endemic (Hunt, 2007; EBRD, 2005; Transparency International, 2005).

The households were selected using a two-stage clustered stratified sampling procedure: in the first stage, the frame of primary sampling units was established using information on local electoral territorial units; in the second stage, a random walk fieldwork procedure was used to select households within primary sampling units. Steves (2011) provides the survey summary, including detailed information on survey design and implementation methodology.

2.2. Variables.

The aim of the empirical part of the paper is to test the relationship between bribing behaviour, on the one hand, and crisis-related variables, on the other. This subsection discusses the construction of the dependent variable (having paid a bribe) and the set of regressors – variables related to the economic crisis and the socio-demographic characteristics of the respondents.

Dependent variable: having paid a bribe.

The interviewees were asked several corruption-related questions. To construct our dependent variable, we use a question which captures actual corruption behaviour most directly. The question has a nested structure. First, the respondents were asked whether, in the last 12 months, they or any of their household members had contact with the following public officials/ institutions: interacting with road police; requesting official documents (visa, passport) from authorities; going to courts for a civil matter; receiving public education (primary or secondary); receiving public education (vocational); receiving medical treatment in the public health system; requesting unemployment benefits; requesting social security benefits. If the answer was positive, the respondents were asked whether an unofficial payment or gift was paid to the public official. We use this information to construct a categorical variable that, for each type of public official, can take three values: 1) the respondent did not use the service, 2) the service was used but no payment or gift was made, and 3) the service was used and payment or gift was made.

The regressors of interest.

Variables capturing the effects of the economic crisis. One of the objectives of the “Life in Transition-2” survey was to ascertain possible effects that the global economic crisis had on the welfare of households. First, the respondents were asked : “How much, if at all, has the economic crisis affected your household in the last two years?”, with possible answers “not at all”, “just a little”, “a fair amount” and “a great deal”. Four dummy variables were created to capture each of the answers. Overall, 27.8% of respondents answered “not at all”, 23% “just a little”, 29.5% “a fair amount”, and 19.7% “a great deal”.⁶ Next, all respondents, except those who answered “not at all”, were asked about the ways in which the economic crisis had affected household income streams. A menu of eleven items, recreated in the first column of Table 2, was offered. The respondents had to indicate all the items that applied to the household, and then to choose the most important one. Table 2 reports the proportions of positive answers, showing that reduced wages were, by far, the most frequently chosen and the most important effect of the crisis, followed by reduced remittances, delayed and suspended wages, and the job loss of the household head or another household member. We created two sets of dummy variables (for “all that apply” and “the most important” answer categories, respectively) to capture different effects of the crisis. We excluded from our analysis the last three items in the list (someone who was working took on a second job; increased working hours in an existing job; someone who was not working before found a new job), as it is possible that these effects represent an improvement in the household well-being, while our focus is on the negative effects of the crisis. Exploring possible links between the remaining eight crisis dummies (in “all that apply” category), we found relatively low correlations between them (see Table A1 of the Appendix for the correlation matrix): the most correlated were the reduced working hours, delayed/suspended wage and reduced wage dummies (the pairwise correlation coefficients ranged between 0.17 and 0.22), followed by the two job loss dummies (0.12). Given such relatively low levels of correlation and a large sample size, we jointly included the eight crisis effect dummies as potential determinants of corruption behaviour.

⁶ This distribution of answers excludes respondents who did not provide an answer to the question (6.6% of the sample). The crisis questions non-respondents, however, are not excluded from the econometric analysis – all regressions, looking at general effects of crisis, contain a crisis-question-missing-value dummy (results for this variable are not reported and are available on request).

Table 2. The effects of the crisis on household income streams.

How has the economic crisis affected you (or other household members) in the past two years?	Tick all that apply (%)	Choose the most important (%)
1. <i>Head of household lost job</i>	10.5	8.4
2. <i>Other household member lost job</i>	11.8	7.5
3. <i>Family business closed</i>	3.2	1.7
4. <i>Working hours reduced</i>	8.1	2.9
5. <i>Wages delayed or suspended</i>	13.1	5.9
6. <i>Wages reduced</i>	29.3	20.1
7. <i>Reduced flow of remittances</i>	13.6	8.5
8. <i>Family members returned home from abroad</i>	2.7	1.2
9. <i>Someone who was working took on a second job</i>	4.2	1.5
10. <i>Increased working hours in an existing job</i>	5.6	2.1
11. <i>Someone who was not working before found a new job</i>	2.9	1.5

Source: Life in Transition-2 survey.

Considering further the effects of the crisis, all the respondents were asked what measures (if any) they had to take as the result of a decline (if any) in income or other economic difficulty. A menu of 19 possible answers, ranging from “reduced the consumption of staple foods” to “forced to move”, was offered; respondents could choose multiple answers. Table 3 shows that, as a result of a decline in income or other economic difficulty, more than a third of all respondents had to reduce the consumption of staple goods and 45% had to reduce the consumption of luxury goods. Reduced consumption of alcohol, use of own car, vacations, as well as delayed utility payments, were reported by 16-23% of respondents. Between 10 and 13% of all respondents said that they had to postpone/ skip visits to the doctor, stop buying medication and reduce tobacco smoking.

Table 3. In the past two years, have you or anyone else in your household had to take any of the following measures as the result of a decline in income or other economic difficulty?

Measure	Proportion of households (%)
<i>Reduced consumption of staple goods</i>	38.3
<i>Reduced consumption of luxury goods</i>	44.9
<i>Reduced consumption of alcohol</i>	16.7
<i>Reduced use of own car</i>	16.4
<i>Reduced vacations</i>	22.8
<i>Reduced tobacco smoking</i>	11.6
<i>Postponed/withdrew from university</i>	2.8
<i>Enrolled in further education because of lack of job opportunities</i>	2.1
<i>Postponed/withdrew from training course</i>	2.6
<i>Postponed/skipped visits to the doctor after falling ill</i>	12.7
<i>Cancelled health insurance</i>	2.9
<i>Stopped buying regular medications</i>	10.0
<i>Stopped/reduced help to relatives who you helped before</i>	9.3
<i>Delayed payment on utilities</i>	16.3
<i>Had utilities cut because of delayed payment</i>	4.2
<i>Cut TV/phone/internet</i>	5.9
<i>Delayed or defaulted on a loan instalment</i>	3.5
<i>Sold an asset</i>	2.8
<i>Was forced to move</i>	1.3

Source: Life in Transition-2 survey.

The correlations between different measures reported in Table 3 do not exceed 0.31 (see Table A2 of the appendix for the correlation matrix); this might justify the joint inclusion of the corresponding dummies into the same regression. However, to reduce the number of regressors, we created several composite dummy variables by merging 1) alcohol and tobacco measures (1 if reduced either alcohol or tobacco, or both, 0 otherwise); 2) the three education-related measures; 3) the three health-care-related measures; 4) the three utilities-related measures; and 5) the measures related to loan repayment, asset selling and being forced to move. The help-to-relatives measure was excluded from our analysis since it is likely to capture the effects of crisis on the well-being of other households. We were left with nine dummy variables capturing adverse effects of crisis on household expenditure and standard of living. They are jointly included in regressions as potential predictors of individual corruption behaviour.

Socio-demographic controls

Following the empirical literature on the micro-determinants of corruption behaviour (Tavits, 2010; Guerrero and Rodriguez-Oreggia, 2008; Soot and Rootalu, 2012; Hunt and Lazslo, 2012; Hunt, 2007; Truex, 2011; Ivlevs and Hinks, 2013), our regressions include the following socio-demographic controls: dummy variables for gender, six age groups, linguistic minority status and three education levels (primary, secondary, tertiary). Household income is captured by a self-reported position on an imagined ten-step income ladder, as well as a wealth index, created using the information on household assets (car, secondary residence, bank account, debit card, credit card, mobile phone, computer and internet access at home)⁷. Further controls include dummy variables for being employed and three types of settlement (rural, urban, and metropolitan).⁸

In addition, we wanted to include variables capturing a respondent's institutional and social trust. People with a high level of trust in public institutions are less likely to tolerate corruption and to break the law (Soot and Rootalu, 2012; Marien and Hooghe, 2011). Therefore, in our regressions, we control for *institutional trust* – a composite variable generated by the summation of trust levels (1 – complete distrust, ..., 5 – complete trust) in different institutions in 1) the government/ cabinet of ministers, 2) local government, 3) courts and 4) the police, and ranging from 4 (complete distrust) to 20 (complete trust). At the same time, we also want to include a variable capturing trust in people (*social trust*), as one could argue that participants involved in an illegal transaction need to trust each other. The variable is based on the question: Generally speaking, do you think most people can be trusted?, with answers ranging from “complete distrust” (1) to “complete trust” (5).

Finally, to control for all unobserved country-wide influences (historical, cultural etc.) on individual corruption behaviour, all regressions include country-fixed effects.

⁷ The wealth index was constructed using principal component analysis. Unfortunately, the survey does not contain information on the actual household (or individual) income. We considered using information on household expenditures on different goods (food, utilities, transport, education, health, clothing and durable goods) as a proxy for household income, but decided against it, as the “do not know”/ non-response rate for several of these expenditure categories is as high as 18% (and much higher for particular countries – e.g., 66% missing answers for the expenditure on durable goods in Uzbekistan), and the proportion of missing values of the composite expenditure variable is 46%.

⁸ See Table A3 of the appendix for summary statistics.

3. Descriptive statistics.

Table 4 reports, for each type of public official/institution, 1) the number of bribery episodes, 2) the proportion of bribery episodes relative to the full sample, 3) the proportion of respondents who have used a public official relative to the full sample, and 4) the proportion of bribery episodes relative to the number of respondents who have contacted a public official. In absolute terms, the highest number of bribery episodes is observed in the public health system (17.5% of all respondents were involved in bribery), followed by the road police (5.7%) and requesting official documents (4.2%). Together, these three types of public officials account for 75% of all bribery episodes. If the comparison is made relative to those respondents who have used a public official, the road police emerge as the most corrupt public service (30.3% of those who interacted with road police paid a bribe), followed by the public health system (25.5%) and vocational public education (18.5%). Courts, unemployment and other social security services had the lowest rates, both in terms of official use (4-10%) and giving a bribe conditional on official use (10-13%).

Table 4. Distribution of bribery and official use across official types

	Bribery episodes	Bribery rate (relative to total sample)	Public official use rate (relative to total sample)	Bribery rate (relative to official use)
Road police	1901	0.057	0.188	0.303
Requesting documents from authorities	1386	0.042	0.230	0.181
Courts	197	0.006	0.044	0.134
Public education (primary and secondary)	1302	0.039	0.254	0.154
Public education (vocational)	1014	0.030	0.164	0.185
Public health system	5839	0.175	0.687	0.255
Unemployment benefits	176	0.005	0.054	0.098
Other social security benefits	320	0.010	0.095	0.101
Stacked data	12135	0.045	0.215	0.212

Source: Life on transition-2 survey.

Table 5 shows the share of respondents affected by the crisis across bribing and official use categories. We observe that, overall, the respondents who paid a bribe are more likely to be affected by the crisis compared with the rest of the sample (panel A of Table 5). The difference is statistically significant at least at the 5 per cent level for all variables capturing the effects of the crisis, except the reduced alcohol and tobacco consumption. Panels B and C

decompose this difference into two effects: the use of official and paying a bribe conditional on the use of official. Panel B shows that people affected by the crisis are significantly more likely to contact public officials. Given contact with public officials, these people are, generally, also more likely to pay a bribe (Panel C). However, some exceptions exist: among public official users, the households who reduced consumption of alcohol and tobacco, the use of their own cars, and the number of vacations were significantly less likely to pay bribes.

On the whole, the descriptive statistics presented in Table 5 support the conjecture that being affected by the crisis increases the likelihood of being involved in corrupt transactions. Both the increased contact with public officials and the higher conditional bribery rates seem to contribute to the positive association between the two phenomena.

Table 5. The use of public officials, bribery and the impacts of crisis

	A. Paid a bribe, full sample		B. Used public official		C. Bribery conditional on official use	
	No	Yes	No	Yes	No	Yes
Affected by crisis (<i>1 'not at all', ..., 4 'a great deal'</i>)	2.408	2.477***	2.394	2.473***	2.472	2.477
Head of household lost job	0.103	0.138***	0.100	0.121***	0.117	0.138***
Other household member lost job	0.116	0.147***	0.113	0.135***	0.132	0.147***
Family business closed	0.031	0.047***	0.029	0.041***	0.040	0.047***
Working hours reduced	0.079	0.125***	0.077	0.096***	0.088	0.125***
Wages delayed or suspended	0.128	0.198***	0.124	0.159***	0.149	0.198***
Wages reduced	0.292	0.322***	0.285	0.323***	0.324	0.322
Reduced remittances	0.135	0.150***	0.134	0.143***	0.141	0.150**
Return of a migrant	0.026	0.051***	0.024	0.038***	0.035	0.051***
Reduced consumption of staple foods	0.383	0.392**	0.386	0.374***	0.369	0.392***
Reduced luxuries	0.447	0.504***	0.437	0.494***	0.491	0.504**
Reduced alcohol and tobacco	0.227	0.235	0.218	0.261***	0.268	0.233***
Reduced use of own car	0.163	0.194***	0.154	0.204***	0.207	0.194***
Reduced vacations	0.228	0.236**	0.216	0.272***	0.281	0.236***
Effects on education	0.061	0.097***	0.054	0.092***	0.091	0.097**
Effects on health	0.180	0.268***	0.179	0.203***	0.185	0.268***
Effects on utilities	0.207	0.260***	0.202	0.236***	0.230	0.260***
Effects on loans/assets/move	0.066	0.088***	0.063	0.079***	0.076	0.088***

Note: The table reports sample means and the results of two-group sample mean comparison tests. *** indicates that the sample mean difference is significant at 1%; ** at 5%.

4. Estimation strategy.

Building up on Ivlevs and Hinks (2013), we model the bribing behaviour as a two-step procedure. In the first step, individuals are selected into contact with a public official. Conditional on this selection, the bribing decision is taken in the second step. We assume that the variables capturing the adverse effects of the economic crisis can affect both the first and the second stages of the process, i.e. the crisis victims may be more likely than those not affected to contact a public official, and, if the interaction takes place, the crisis victims may be more likely to pay a bribe compared with those interacting with public officials but not affected by the crisis. Our objective is to estimate the importance of the crisis-related variables in explaining both stages of the process, thereby decomposing the total ‘effect’ of the crisis-related variables on the probability of paying a bribe.

To estimate such a two-stage model, we use the Heckman selection procedure. To operationalise the model, it is considered good practice to use a different set of regressors in the selection and outcome equations (see e.g. Baum 2006); more precisely, we need an exclusion variable that would affect the probability of interaction with public officials but not necessarily the probability of making a bribe. To generate such an identification variable, we considered particular household/ respondent circumstances that were likely to increase contact with different types of public officials/institutions. We observe that households having a car are more likely to interact with road police; households with children are more likely to contact primary and secondary education establishments, as well as institutions in charge of social security benefits; students are more likely to contact vocational education establishments, as well as request official documents (e.g. passports); the less healthy are more likely to receive medical treatment; those who have recently lost their job are more likely to contact institutions in charge of unemployment benefits; and those who rent or have inherited their house/flat are more likely to go to courts for a civil matter. We use this information to construct a binary variable (for each type of public official), which takes the value of 1 if the characteristic is observed and 0 otherwise.

The socio-demographic characteristics (age, gender, education, perceived income, wealth index, minority status, employment status, and degree of urbanisation), institutional and social trust, as well as country fixed effects, are included in both the selection and outcome equations.

Given that each respondent was asked about the actual corrupt behaviour eight times – in consideration of eight different types of public officials – we follow Hunt and Laszlo (2012) to generate a stacked dataset that contains eight observations per respondent /household corresponding to interactions with eight institution types. The unit of observation thus becomes the household-official pair. To control for possible interdependence of responses provided by the same respondent, and to account for different types of institutions/officials, we clustered standard errors at the household level and included dummy variables for each type of public officials in both the selection and outcome equation.

5. Econometric results

Table 6 reports the results of the regressions estimating the probability of making a bribe as a two-stage process: first, the selection into contact with public officials and, second, the selection into making a bribe conditional on the use of public officials. For brevity, only the marginal effects of the Heckman probit coefficients are reported. Our first specification excludes the crisis-related variables, representing a benchmark case. Considering the contact with public officials (upper panel), we first notice that the selection-into-contact-with-public-official dummy's coefficient is positive and highly significant; the presence of the selection characteristic increases the respondent's likelihood of contacting a public official by 22 percentage points.⁹ Compared with 35-44 year olds, 18-24, 25-34 and 45-54 year-olds are 1-2 percentage points less likely, and the 55-64 and 65+ age groups are 4-6 percentage points less likely, to contact public officials. People positioning themselves higher on an income ladder are less likely to contact officials, while those with higher wealth are more likely to do so. Compared with respondents with secondary education, those with primary education are 0.5 percentage points less likely to contact public officials. Living in metropolitan (as compared to other urban) areas is associated with 0.7 percentage points higher probability of contacting public officials.

The lower panel of Table 6 reveals the characteristics of those respondents who are more likely to be involved in corrupt exchanges, once the selection into contact with public officials has been taken into account. Compared with respondents aged 35-44, those aged 55-

⁹ We have also checked the significance of the selection dummy variable for each type of public official (by running separate regressions for each type of public officials). In all cases, the coefficients were positive and significant at the 1 per cent; the economic effects ranged from 1 percentage point (courts) to 37 percentage points (primary education).

64 and over-65 are 1.4-2.5 percentage points less likely to pay bribes. Linguistic minorities are 1.4 percentage points more likely to pay bribes. The marginal effects of both perceived income and the wealth index are positive and statistically significant – a result consistent with Hunt and Laszlo (2012), Guerrero and Rodriguez-Oreggia (2008) and Mocan (2008), which can be explained by the higher opportunity costs of wealthier people who are willing and able to pay public officials for a quicker and better service, or propensity of corruption-prone officials to target people with higher incomes. Finally, trust in institutions is associated with a lower likelihood of bribery: an increase of institutional trust by one unit (on a scale from 1 to 20) from the mean (11.73) is associated with a 0.8 percentage points lower probability of paying bribes to public officials. This finding corroborates the micro-level evidence that people with high level of institutional trust are less likely to tolerate corruption and to break the law (Soot and Rootalu, 2012; Marien and Hodge, 2011).

Considering the appropriateness of the Heckman probit model, we notice that, in the benchmark, as well as in all other specifications, the *rho* term is negative and statistically significant, meaning that the disturbances in the selection and outcome equations are negatively correlated. With the selection and outcomes equations not being independent, the two-stage Heckman probit is a preferred estimation method; a naïve binary probit model would generate biased results.

Next, we introduce four dummy variables to capture the general effects of the crisis (Column 2 in Table 6). They draw on the answers to the question “How much, if at all, has the economic crisis affected your household in the last two years?” These variables emerge as important predictors of both public official use and the likelihood of bribery conditional on official use. Compared with households who were “not at all” affected by crisis (the reference group) and keeping other factors unchanged, those affected by crisis “just a little”, “a fair amount” and “a great deal” are 1.9, 3.3 and 5 percentage points, respectively, more likely to contact public officials. Among the public official users, the crisis victims are also more likely to pay bribes than the non-victims: those affected by crisis “just a little”, “a fair amount” and “a great deal” are 4, 4.5 and 5.5 percentage points, respectively, more likely to pay bribes. These results thus lend support to the idea that being affected by the economic crisis results in more frequent corrupt exchanges.

Table 6. The determinants of public official use and paying bribes, Heckman probit marginal effects.

	[1]	[2]
<u>Selection equation: probability of contacting a public official</u>		
Affected by crisis		
<i>Not at all</i>	-	<i>Ref.</i>
<i>Just a little</i>	-	0.019***
<i>A fair amount</i>	-	0.033***
<i>A great deal</i>	-	0.050***
Selection into contact	0.211***	0.211***
Female	-0.001	-0.001
Age group:		
18-24	-0.012***	-0.011***
25-34	-0.020***	-0.019***
35-44	<i>Ref.</i>	<i>Ref.</i>
45-54	-0.010***	-0.010***
55-64	-0.039***	-0.037***
65+	-0.057***	-0.051***
Linguistic minority	-0.003	-0.005*
Income ladder	-0.003***	-0.001**
Wealth index	0.018***	0.018***
Education		
Primary	-0.005*	-0.005*
Secondary	<i>Ref.</i>	<i>Ref.</i>
Tertiary	0.001	0.002
Employed	0.000	-0.000
Area of residence		
Rural	0.003	0.004
Urban	<i>Ref.</i>	<i>Ref.</i>
Metropolitan	0.007*	0.007**
Trust in institutions	-0.000	0.000
Trust in people	0.002	0.002
<u>Outcome equation: Probability of bribery conditional on official use</u>		
Affected by crisis		
<i>Not at all</i>	-	<i>Ref.</i>
<i>Just a little</i>	-	0.040***
<i>A fair amount</i>	-	0.044***
<i>A great deal</i>	-	0.055***
Female	-0.005	-0.005
Age group:		
18-24	-0.010	-0.008
25-34	0.003	0.004
35-44	<i>Ref.</i>	<i>Ref.</i>
45-54	-0.008	-0.007
55-64	-0.025***	-0.022***
65+	-0.014**	-0.007
Linguistic minority	0.014**	0.012**
Income ladder	0.004***	0.006***
Wealth index	0.003*	0.003*
Education		
Primary	0.001	0.001
Secondary	<i>Ref.</i>	<i>Ref.</i>
Tertiary	-0.001	0.000
Employed	-0.004	-0.004
Area of residence		
Rural	0.001	0.002
Urban	<i>Ref.</i>	<i>Ref.</i>
Metropolitan	-0.007	-0.007
Trust in institutions	-0.008***	-0.007***
Trust in people	0.003	0.002
Number of household-official pairs	261744	261744
P > Chi ²	0.000	0.000
Number of households	32718	32718
Rho	-0.085	-0.082
Prob > Chi ² (<i>Rho</i> =0)	0.017	0.021

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Marginal effects are calculated at the variable means. The unit of observation is household-official pair. Standard errors are clustered at household level. All regressions include public official/institution and country fixed effects.

In Table 7, the dummy variables capturing general effects of crisis on the household welfare are replaced with dummy variables capturing the eight specific adverse effects on the households' income streams. In specification [1], each household is allowed to report multiple effects of the crisis on its income streams. The results suggest that the crisis-related job loss, closure of family business, delayed, suspended or reduced wages are associated with a 1.7-2.9 percentage points higher probability of both contacting public officials and paying bribes conditional on contacting public officials. Migration-related variables are also important predictors of bribery: the reduced flow of remittances raises the probability of contacting public officials by 3.3 percentage points and the probability of paying bribes by 2.4 percentage points; the respective figures for the crisis-induced return migration are 4.7 and 2.9 percentage points. Reduced working hours is the only variable that is not a significant predictor of the likelihood of contacting public officials; it is, however, associated with a 2.8 percentage point increase in the probability of paying a bribe conditional on using public officials.

Specification [2] of Table 7 replaces the variables capturing *various* effects of the crisis on household income streams with the variables capturing *the most important* effects. We obtain highly significant coefficients for all crisis-related dummies, which have larger marginal effects when compared with specification [1]. In particular, the crisis-provoked job loss, family business closure, and migration-related effects raise the likelihood of contacting public officials by 4.1-5 percentage points, and all eight crisis-related dummies raise the probability of bribery conditional on official use by 3.2-5.1 percentage points. The larger marginal effects in specification [2], compared with [1], are explained by the lack of overlap between the different measures of economic crisis.

Specification [3] of Table 7 replaces the (broadly defined) income effects of the crisis with the (broadly defined) expenditure effects. In the selection stage of the bribery process, the coefficients of all variables, except staple goods, are positive and highly significant, with the marginal effects ranging from 1 to 2.4 percentage points. A relatively high increase (by 5.1 percentage points) in the probability of contacting public officials is associated with the crisis-induced changes in educational activities. This is not surprising, as a withdrawal from

university, training or enrolment in further education necessitates a contact with representatives from educational institutions. Looking at the outcome stage of the bribery process, the reduced consumption of staple goods, alcohol and tobacco are insignificant predictors of bribery, while the coefficient of all other variables are positive and highly significant, with marginal effects ranging from 1.1 to 3 percentage points. Overall, using the reduced consumption of (especially, non-staple) goods to capture the effects the crisis, our findings support the hypothesis that the crisis-hit households are more likely to pay bribes.

Finally, the negative association between the effects of crisis and involvement in bribery is further supported in specification [4] of Table 7, where we jointly include the effects of the crisis on the income streams (the most important effects only, non-overlapping) and the effects on different household expenditures. The variables that were significant in specifications [2] and [3] tend to remain positive and highly significant, although their marginal effects have become somewhat smaller.¹⁰ Only the family business closure and the reduced consumption of staple goods, alcohol and tobacco are either statistically insignificant or negative predictors of corruption behaviour.

¹⁰ The lower marginal effects are to be expected, as more overlapping variables have been used to capture the effects of the crisis.

Table 7. Impacts of the crisis on household income streams and expenditures and the two stages of the corruption process, Heckman probit marginal effects.

	[1]	[2]	[3]	[4]
<u>Selection equation: probability of contacting a public official</u>				
Effects on income streams				
<i>Head of household lost job</i>	0.029***	0.050***	-	0.032***
<i>Other household member lost job</i>	0.024***	0.041***	-	0.025***
<i>Family business closed</i>	0.024***	0.050***	-	0.033***
<i>Working hours reduced</i>	0.004	0.016**	-	0.006
<i>Wages delayed or suspended</i>	0.021***	0.027***	-	0.014***
<i>Wages reduced</i>	0.017***	0.020***	-	0.010***
<i>Reduced flow of remittances</i>	0.033***	0.041***	-	0.031***
<i>Migrant returned home from abroad</i>	0.047***	0.046***	-	0.032***
Effects on expenditures				
<i>Reduced staple goods</i>	-	-	-0.000	-0.003
<i>Reduced luxuries</i>	-	-	0.010***	0.008***
<i>Reduced car</i>	-	-	0.013***	0.012***
<i>Reduced vacations</i>	-	-	0.009***	0.007***
<i>Reduced alcohol/ smoking</i>	-	-	0.018***	0.016***
<i>Effects on education</i>	-	-	0.051***	0.049***
<i>Effects on medical expenditures</i>	-	-	0.024***	0.023***
<i>Effects on utilities</i>	-	-	0.016***	0.014***
<i>Effects on assets/ loans/ move</i>	-	-	0.020***	0.018***
<u>Outcome equation: probability of paying a bribe</u>				
Effects on income streams				
<i>Head of household lost job</i>	0.026***	0.047***	-	0.029***
<i>Other household member lost job</i>	0.023***	0.046***	-	0.031***
<i>Family business closed</i>	0.018*	0.032**	-	0.018
<i>Working hours reduced</i>	0.028***	0.051***	-	0.040***
<i>Wages delayed or suspended</i>	0.019***	0.041***	-	0.027***
<i>Wages reduced</i>	0.023***	0.033***	-	0.022***
<i>Reduced flow of remittances</i>	0.024***	0.037***	-	0.027***
<i>Migrant returned home from abroad</i>	0.029***	0.042***	-	0.026*
Effects on expenditures				
<i>Reduced staple goods</i>	-	-	0.002	-0.001
<i>Reduced luxuries</i>	-	-	0.011***	0.008**
<i>Reduced car</i>	-	-	0.011**	0.009*
<i>Reduced vacations</i>	-	-	0.018***	0.016***
<i>Reduced alcohol/ smoking</i>	-	-	-0.003	-0.004
<i>Effects on education</i>	-	-	0.021***	0.019***
<i>Effects on medical expenditures</i>	-	-	0.030***	0.028***
<i>Effects on utilities</i>	-	-	0.019***	0.016***
<i>Effects on assets/ loans/ move</i>	-	-	0.025***	0.023***
Number of household-official pairs	261744	261744	261744	261744
P > Chi2	0.000	0.000	0.000	0.000
Number of households	32718	32718	32718	32718
Rho	-0.095	-0.088	-0.083	-0.085
Prob > Chi ² (Rho=0)	0.007	0.013	0.018	0.016

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Marginal effects estimated at regressor means. The unit of observation is household-official pair. Standard errors clustered at household level. The same individual-level regressors as in table 6 are included in all regressions. All regressions include public official/institution and country fixed effects.

Crisis and reasons for bribery

Earlier we suggested several reasons why crisis victims would be more likely to bribe than would non-victims. First, crisis victims could be more vulnerable and less able to protect themselves, which would make them an easy target for corruption-prone public officials. Second, crisis victims may have to reveal sensitive information to public officials – income level, occupation, return of a household member from abroad – helping public officials to decide whether to extort and, if so, how much. Finally, being hit by a shock (e.g. crisis-induced family business closure) and wanting to get back on track quickly, crisis victims may be more likely to offer bribes compared with the average user of public services.

The Life in Transition-2 survey contains information on reasons for paying bribes, which we can use to test whether crisis victims have different reasons for bribery compared with non-victims. In particular, those individuals who reported bribing public officials were asked a follow-up question: “Why did you make an informal payment for services you should have received for free?” Possible answers included “I was asked to pay” (28% of respondents provided this reason), “I was not asked to pay but I knew that an informal payment was expected” (29%), “I offered to pay, to get things done quicker or better” (19%) and “I was not asked to pay but I wanted to express my gratitude” (19%), and 5% of respondents refused to answer. Given the unordered nature of answers, we study the determinants of various reasons for paying bribes in a multinomial logit model.

Table 8 reports the marginal effects of variables capturing general effects of crisis in a multinomial logit regression explaining different reasons for paying bribes (including the ‘refused to answer’ category). The results suggest that crisis victims and non-victims are equally likely to report that they made an informal payment because they knew it was expected or because they wanted to get things done quicker and better. However, bribe payers affected by the crisis ‘a great deal’ were 5.1 percentage points more likely to be asked for a bribe by public officials and 3.5 percentage points less likely to pay bribes out of gratitude, relative to households which were not affected by the crisis. This finding supports the hypothesis that the victims of the crisis are an easier target for extortion by public officials. The finding is, however, attenuated by the households who were affected by crisis ‘just a little’. Relative to households who were not affected by the crisis, they are 3.6 percentage points less likely to be asked for bribes and 2.4 percentage points more likely to bribe in order to express gratitude. This might suggest a non-linear relationship between the degree to

which households were affected by crisis and different motivations to make informal payments.

Table 8. Effects of crisis and motivations to pay bribes, multinomial logit marginal effects.

I was asked to pay	
<i>Not at all</i>	Ref.
<i>Just a little</i>	-0.036**
<i>A fair amount</i>	0.011
<i>A great deal</i>	0.051***
I was not asked to pay but I knew that an informal payment was expected	
<i>Not at all</i>	Ref.
<i>Just a little</i>	-0.012
<i>A fair amount</i>	-0.007
<i>A great deal</i>	-0.019
I offered to pay, to get things done better and quicker	
<i>Not at all</i>	Ref.
<i>Just a little</i>	0.019
<i>A fair amount</i>	-0.001
<i>A great deal</i>	0.003
I was not asked to pay, but I wanted to express my gratitude	
<i>Not at all</i>	Ref.
<i>Just a little</i>	0.024**
<i>A fair amount</i>	-0.015
<i>A great deal</i>	-0.035***
Refused to answer	
<i>Not at all</i>	Ref.
<i>Just a little</i>	0.005
<i>A fair amount</i>	0.011*
<i>A great deal</i>	0.001

Notes: Marginal effects calculated at variable means . Regression summary statistics: Wald $\chi^2 = 31383.68$; $\text{Prob} > \chi^2 = 0.000$; Pseudo $R^2 = 0.11$. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The unit of observation is household-official pair, the sample includes bribing episodes only (altogether 11,314). Standard errors clustered are at household level (altogether 7,246 households). The same individual-level regressors as in table 6 are included in all regressions; the regression also includes public official/institution and country fixed effects.

Robustness and sensitivity checks

The post-socialist economies of Central and Eastern Europe and Central Asia are far from being a homogenous group. Massive differences exist in income levels, historical and cultural paths, current political regimes and institutions. Given such heterogeneity, one could hypothesise that the strength of the link between corruption and crisis depends on country-level characteristics. In those countries where public officials are less well-off compared with others in society or relative to public officials in the richest countries in the region, there may be a greater likelihood of these officials extorting money from crisis victims. It could also be that in more corrupt countries there is a cultural acceptance of paying bribes which makes paying bribes by victims of the economic crisis more likely even if these crisis victims have never bribed before. In this subsection, we take a closer look at the link between corruption

and economic crisis and whether this link differs between regions, and test its possible dependence on two country-level characteristics – GDP per capita and control of corruption.

We start by estimating our model for different geo-political regions. Table 9 reports the marginal effects of the general effects of the crisis for the two stages of the corruption process. In all country groups, households affected by crisis are more likely to contact public officials. Being affected ‘a great deal’ tends to have the strongest association with contact, with marginal effects ranging from 3.1 percentage points in the Baltics to 5.3 percentage points in the Balkans. In contrast, the association between being affected by the crisis and conditional bribery differs across country groups: the strongest association is observed in Central Asia (among public official users, people who were affected by crisis ‘a great deal’ were 24.2 percentage points more likely to pay bribes than those who were not affected by crisis), followed by Slav ex-USSR (5.6 percentage points) and the Balkans (2.8 percentage points), while the results for the Baltics and Central Europe are statistically insignificant.

Table 9. General effects of crisis and bribery, by geo-political region.

	Balkans	Baltics	Caucasus	Central Europe	Central Asia	Slav ex-USSR
Selection into contact						
<i>Not at all</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Just a little</i>	0.013**	0.008	0.027***	0.030***	0.007	0.031***
<i>A fair amount</i>	0.035***	0.007	0.025***	0.043***	0.041***	0.030***
<i>A great deal</i>	0.055***	0.028**	0.035***	0.047***	0.042***	0.049***
Bribery						
<i>Not at all</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Just a little</i>	0.036***	0.005	0.064***	0.002	0.112***	0.033**
<i>A fair amount</i>	0.024***	0.004	0.026*	0.010	0.160***	0.044**
<i>A great deal</i>	0.028***	0.007	0.030	0.017	0.242***	0.055**
Number of household-official pairs	78512	23704	23744	44496	35200	32176
P > Chi2	0.000	0.000	0.000	0.000	0.000	0.000
Number of households	9814	2963	2968	5562	4400	4022
Rho	0.018	0.092	-0.343	-0.338	-0.035	-0.174
Prob > Chi ² (<i>Rho</i> =0)	0.794	0.437	0.000	0.001	0.674	0.019

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The unit of observation is household-official pair. Standard errors clustered at household level. The same individual-level regressors as in table 6 are included in all regressions. All regressions include public official/institution and country fixed effects.

A contrast in the outcome equation results for Central Asia, on the one hand, and Central Europe and the Baltics, on the other, would suggest that the link between crisis and corruption is stronger in poorer and more corrupt countries. To test these conjectures, we run our main Heckman probit model by including a continuous variable that captures general

effects of the crisis¹¹ and successively interacting it with the country's GDP per capita (constant USD for 2009, data from World Bank Indicators) and a variable capturing a country's control of corruption in 2009 (percentiles ranging from 0 (lowest control, most corrupt) to 100 (highest control, least corrupt) from the World Bank World Government Indicators).¹²

Table 10 reports the results of two Heckman probit regressions with interaction terms. The results in the first regression suggest that, irrespective of a country's GDP per capita (the interaction term is insignificant), crisis victims are always more likely to contact public officials than the non-victims. However, in the outcome equation, the interaction term is negative and statistically significant, implying that, conditional on contacting public officials, the crisis victims are less likely to bribe in richer countries. A similar picture is obtained in the second regression, where the continuous extent of crisis variable is interacted with a variable capturing control of corruption. Relative to households not affected by crisis, crisis victims are more likely to contact public officials, irrespective of the country's corruption control environment, but, conditional on contact with public officials, the crisis-victims are more likely to bribe than the non-victims if corruption in a country is more widespread.

Overall, our results suggest that a country's overall level of income and the extent to which corruption is controlled do not matter when it comes to contacting public officials because of the economic crisis. It is not surprising: a suddenly unemployed person is equally likely to visit an office in charge of unemployment benefits in both poor and rich countries. The country characteristics, however, do matter in the second, direct, stage of the corruption process - when it comes to paying bribes once contact with public officials has taken place. Here the crisis-victims are particularly likely to bribe public officials in poorer and/or more corrupt countries of the region.

¹¹ The variable takes the value 1 if the household was 'not at all' affected by crisis, 2 if affected 'just a little', 3 if affected 'a fair amount' and 4 if affected 'a great deal'. The disadvantage of this approach is that we impose an equal distance between contiguous effects of the crisis, while the advantage is the brevity of results' exposition. We have also checked whether our results stay unchanged if the model with crisis effects dummies (rather than a continuous effects-of-crisis variable) is estimated for different country groups, for instance, high- and low-income countries, high and low-corruption countries etc. The results remain qualitatively unchanged.

¹² The results are robust to using alternative measures of country corruption environment, e.g., the Corruption Perception Index from Transparency International.

Table 10. Interacting the effects-of-crisis variable with country-level indicators.

	Selection equation: contact with public officials	Outcome equation: bribery conditional on contact
<i>Regression 1</i>		
Affected by crisis	0.053***	0.098***
Affected by crisis * GDP per capita/100 in 2009	0.002	-0.009**
<i>Regression2</i>		
Affected by crisis	0.063***	0.146***
Affected by crisis*control of corruption in 2009	0.000	-0.002***

Notes: Results of two different Heckman probit regressions. Unit of observation is household-official pair. Both regressions include the same controls as in Table 3, as well as country and public official fixed effects. Standard errors clustered at household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The variable affected by crisis ranges from 1 (not at all) to 4 (a great deal). GDP per capita/100 ranges from 2.66 (Tajikistan) to 126.14 (Slovenia); control of corruption ranges from 5.7 (Uzbekistan) to 81.3 (Slovenia).

Types of public officials

So far, our analysis has merged different types of public officials. However, it can be argued that crisis victims do not bribe all types of public officials in the same manner. Considering the contact stage, most crisis victims would approach institutions dealing with unemployment and social security benefits. If the crisis worsens a person's health or the loss and lack of jobs makes a person consider further education opportunities, contacts with hospitals and educational institutions is more likely. If crisis victims fail to make regular payments (e.g. rent, mortgage) or are not able to honour agreements, they may also be contacted by courts. However, there would be little reason for crisis victims to contact (or be contacted by) the road police.

Considering conditional bribery, the basis under which interaction with public officials takes place would determine whether crisis victims are more likely to bribe or not. Total interaction time could be important: for example, a road policeperson would have insufficient time to ascertain if someone has suffered because of the crisis and are thus be unable to extort. Public officials from other institutions can allow more time (and, in many cases, are obliged) to collect information about customers' job or salary histories, which could help inform their bribe extortion decisions. Also, repeated interactions, which are less likely to occur for road

police and more likely for other types of public officials, could be more conducive to extorting bribes from the crisis victims.

To test these conjectures, we have estimated our main model for different types of public officials. The top panel of Table 11 shows that crisis victims are more likely than non-victims to contact all types of public officials, although the size of marginal effects is smaller for courts and the effect tends to be non-linear for the police specification. More differences emerge in the outcome equation (bottom panel of Table 11): while the victims and non-victims of crisis are equally likely to bribe the road police and, to a certain extent, courts, the victims are more likely to bribe all other types of public officials. This supports the idea that interaction time and frequency of interactions are important for bribery. Overall, our results highlight the context-specific nature of the link between corruption and crisis: it is weaker for the road police and courts, and stronger (and comparable in terms of magnitude) for other types of public officials.

Table 11. General effects of crisis and bribery, by type of public official/institution.

	Road police	Requesting official documents	Courts	Education (primary and secondary)	Education (vocational)	Health	Unemployment and other social security benefits
Selection into contact							
<i>Not at all</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Just a little</i>	0.021***	0.015**	0.005	0.024***	0.023***	0.040***	0.010***
<i>A fair amount</i>	0.022***	0.037***	0.010***	0.026***	0.036***	0.055***	0.028***
<i>A great deal</i>	0.011*	0.043***	0.024***	0.052***	0.049***	0.054***	0.057***
Bribery							
<i>Not at all</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Just a little</i>	0.026	0.041***	0.010	0.044***	0.035**	0.064***	0.044***
<i>A fair amount</i>	0.024	0.056***	0.062*	0.046***	0.044***	0.066***	0.045***
<i>A great deal</i>	0.017	0.057***	0.035	0.057***	0.075***	0.082***	0.059***
Number of observations	32,718	32,718	31,671	32,718	30,684	32176	65,436
P > Chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rho	0.021	-0.903	0.216	0.083	-0.053	-0.174	-0.140
Prob > Chi ² (<i>Rho</i> =0)	0.788	0.008	0.807	0.190	0.563	0.019	0.490

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The unit of observation is household-official pair. Standard errors clustered at household level. The same individual-level regressors as in table 6 are included in all regressions. All regressions include country fixed effects.

Conclusions

This study has investigated possible household-level linkages between the effects of the 2008 economic crisis and corrupt behaviour in transition economies of Central and Eastern Europe and Central Asia. We modelled corruption as a two-stage process. In the first stage, people decide whether to contact a public official, and in the second stage public official users decide whether to pay bribes. We found evidence that the economic crisis affects both stages of the process, potentially increasing bribery indirectly through an increased probability of contacting public officials, and directly through an increased probability of paying bribes conditional on contacting public officials.

We also found that, among bribers, crisis victims are more likely than non-victims to bribe because they are asked to do so by public officials and less likely to bribe out of gratitude. This finding is consistent with the idea of crisis victims being a relatively easy target for public officials since they are more vulnerable.

Whilst crisis victims are more likely to contact public officials than non-victims throughout our sample of countries, important regional differences emerge in the outcome equation results. Among public official users, crisis victims in Central Asia and, to a lesser extent, the Balkans and Slav ex-USSR (Russia, Ukraine, Belarus) are more likely to pay bribes. These three country groups drive the outcome equation results for the whole sample, as the corresponding variables are largely insignificant in the remaining country groups. Given that ‘crisis-effects’ tend to be more important in determining corruption in poorer and more corrupt regions of the post-socialist space, we formally test whether country-wide GDP per capita and corruption environment condition the strength of the link between individual-level effects of crisis and corruption. We find that the association between the two phenomena increases as countries’ GDP per capita and the extent to which corruption is controlled falls, i.e. crisis-victims are more likely to be involved in bribery in poorer and more corrupt countries.

Our results suggest that the victims of the economic crisis pay a double price – they experience a fall in their welfare due to a job loss, wage cut or a fall in remittances – but they also pay more bribes, which further reduces their welfare. Assuming that the economic crisis affects people randomly, our results also suggest that a fall in material welfare leads to a

higher likelihood of being involved in bribery.¹³ This corroborates the finding of Hunt (2007) that the victims of misfortunes are more likely to bribe public officials. At the same time, we find that people with a higher perceived income and more wealth are more likely to bribe. This is consistent with the literature showing that better-off people are more prone to corruption. Overall, our study highlights the importance of different dimensions of household income and wealth in explaining bribing behaviour: both higher wealth and negative income shocks are likely to result in more corruption.

¹³ It is quite possible that certain groups of people and households are more likely to be hit crisis than others, i.e. that an economic crisis hits people non-randomly. For example, people working without an employment contract would be the first to be fired if the crisis forces a firm to scale down its activity. If people, who accept or are forced to work illegally, also happen to be more prone to corruption, our results will suffer from the omitted variable bias. To mitigate potential endogeneity of the crisis variables, we estimated our main model with additional controls: a dummy variable for working in the main jobs without a work contract, and dummy variables for 26 sectors/ industries. The latter were included because certain industries, such as construction, are more likely to employ illegal workforce compared, for example, with public sector occupations (education, health). The inclusion of these controls did not change our results: compared to households which were not affected by crisis, those affected ‘just a little’, ‘a fair amount’ and ‘a great deal’ were 1.9, 3.3 and 4.9 percentage points more likely to contact public officials and 4.0, 4.4 and 5.4 percentage points more likely to pay bribes conditional on contact (results similar to those reported in Table 6).

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Appendix

Table A1. Correlation between the effects of crisis on income streams.

	<i>Head of household lost job</i>	<i>Other household member lost job</i>	<i>Family business closed</i>	<i>Working hours reduced</i>	<i>Wages delayed or suspended</i>	<i>Wages reduced</i>	<i>Reduced flow of remittances</i>
<i>Other household member lost job</i>	0.1247*						
<i>Family business closed</i>	0.0898*	0.0763*					
<i>Working hours reduced</i>	0.0170*	0.0361*	0.0485*				
<i>Wages delayed or suspended</i>	0.0536*	0.0645*	0.0387*	0.1762*			
<i>Wages reduced</i>	0.0138*	0.0406*	-0.0102	0.1755*	0.2201*		
<i>Reduced flow of remittances</i>	-0.0015	0.0093	0.0167*	0.0225*	0.0153*	0.0150*	
<i>Family members returned home from abroad</i>	0.0482*	0.0675*	0.0649*	0.0273*	0.0538*	0.0292*	0.0877*

Note: * Correlation significant at 5%.

Table A1. Correlation between the effects of crisis on household expenditures.

	<i>Reduced consumption of staple goods</i>	<i>Reduced consumption of luxury goods</i>	<i>Reduced consumption of alcohol</i>	<i>Reduced use of own car</i>	<i>Reduced vacations</i>	<i>Reduced tobacco smoking</i>	<i>Postponed/withdrew from university</i>	<i>Enrolled in further education</i>
<i>Reduced consumption of luxury goods</i>	0.1473*							
<i>Reduced consumption of alcohol</i>	0.1679*	0.3005*						
<i>Reduced use of own car</i>	0.0972*	0.2439*	0.2515*					
<i>Reduced vacations</i>	0.0303*	0.3086*	0.2250*	0.2792*				
<i>Reduced tobacco smoking</i>	0.1000*	0.1530*	0.3071*	0.1654*	0.1818*			
<i>Postponed/withdrew from university</i>	0.0497*	0.0748*	0.0875*	0.0983*	0.0951*	0.0955*		
<i>Enrolled in further education</i>	0.0178*	0.0607*	0.0797*	0.1098*	0.0976*	0.0702*	0.1863*	
<i>Postponed/withdrew from training course</i>	0.0225*	0.0687*	0.0643*	0.0801*	0.0852*	0.0696*	0.1780*	0.1772*
<i>Postponed/skipped visits to the doctor after falling ill</i>	0.2237*	0.0928*	0.0574*	0.0408*	0.0184*	0.0771*	0.0764*	0.0727*
<i>Cancelled health insurance</i>	0.0723*	0.0679*	0.0919*	0.0714*	0.0672*	0.0961*	0.1173*	0.1057*
<i>Stopped buying regular medications</i>	0.2271*	0.0762*	0.0480*	0.0275*	0.0009	0.0729*	0.0556*	0.0592*
<i>Stopped/reduced help to relatives who you helped before</i>	0.0850*	0.1299*	0.1054*	0.1331*	0.1314*	0.0793*	0.0892*	0.0988*
<i>Delayed payment on utilities</i>	0.1999*	0.1263*	0.0952*	0.0794*	0.0940*	0.1001*	0.0795*	0.0457*
<i>Had utilities cut because of delayed payment</i>	0.1047*	0.0677*	0.0841*	0.0632*	0.0419*	0.0896*	0.0861*	0.0552*
<i>Cut TV/phone/internet</i>	0.0933*	0.1010*	0.1261*	0.1022*	0.0928*	0.1007*	0.0615*	0.0356*
<i>Delayed or defaulted on a loan instalment</i>	0.0484*	0.0722*	0.0747*	0.0723*	0.0927*	0.0737*	0.0689*	0.0514*
<i>Sold an asset</i>	0.0573*	0.0460*	0.0568*	0.0502*	0.0471*	0.0665*	0.0535*	0.0434*
<i>Was forced to move</i>	0.0265*	0.0202*	0.0318*	0.0140*	0.0204*	0.0340*	0.0595*	0.0366*

Table A2 continued.

	<i>Postponed/withdrew from training course</i>	<i>Postponed/skipped visits to the doctor after falling ill</i>	<i>Cancelled health insurance</i>	<i>Stopped buying regular medications</i>	<i>Stopped/reduced help to relatives who you helped before</i>	<i>Delayed payment on utilities</i>	<i>Had utilities cut because of delayed payment</i>	<i>Cut TV/phone/internet</i>	<i>Delayed or defaulted on a loan instalment</i>	<i>Sold an asset</i>
<i>Postponed/skipped visits to the doctor after falling ill</i>	0.0772*									
<i>Cancelled health insurance</i>	0.0879*	0.1650*								
<i>Stopped buying regular medications</i>	0.0485*	0.4229*	0.2037*							
<i>Stopped/reduced help to relatives who you helped before</i>	0.0812*	0.1419*	0.1252*	0.1387*						
<i>Delayed payment on utilities</i>	0.0561*	0.2015*	0.1020*	0.1715*	0.1210*					
<i>Had utilities cut because of delayed payment</i>	0.0559*	0.1090*	0.1222*	0.1094*	0.0859*	0.2414*				
<i>Cut TV/phone/internet</i>	0.0396*	0.0660*	0.0533*	0.0496*	0.0914*	0.1927*	0.2103*			
<i>Delayed or defaulted on a loan instalment</i>	0.0656*	0.0743*	0.0878*	0.0539*	0.0896*	0.2004*	0.1346*	0.1401*		
<i>Sold an asset</i>	0.0395*	0.0665*	0.0604*	0.0664*	0.0720*	0.0969*	0.1149*	0.0998*	0.1160*	
<i>Was forced to move</i>	0.0488*	0.0330*	0.0475*	0.0246*	0.0524*	0.0436*	0.0549*	0.0641*	0.0827*	0.1336*

Note: * Correlation significant at 5%.

Table A3. Summary statistics of variables included in the analysis.

	N	Mean	St.dev.	Min	Max
Female	33316	0.611	0.487	0	1
Age 18-24	33340	0.127	0.333	0	1
Age 25-34	33340	0.203	0.402	0	1
Age 35-44	33340	0.185	0.388	0	1
Age 45-54	33340	0.172	0.378	0	1
Age 55-64	33340	0.148	0.355	0	1
Age 65+	33340	0.164	0.371	0	1
Linguistic minority	33360	0.133	0.339	0	1
Perceived position on 1-10 income ladder	32789	4.324	1.674	1	10
Wealth index	33360	-0.277	1.704	-2.711	3.328
Primary education	33351	0.302	0.459	0	1
Secondary education	33351	0.505	0.500	0	1
Tertiary education	33351	0.193	0.395	0	1
Employed	33360	0.480	0.500	0	1
Rural	33360	0.417	0.493	0	1
Urban	33360	0.462	0.499	0	1
Metropolitan	33360	0.121	0.327	0	1
Trust in institutions	33360	11.596	3.992	4	20
Trust in people	33360	2.939	1.030	1	5
Selection into contact ^a	266880	0.247	0.431	0	1
Contacted public officials ^a	266880	0.215	0.410	0	1
Paid bribe once contact with public officials has taken place ^a	57247	0.212	0.409	0	1

^a Based on stacked (household-official pairs) data

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