The Determinants of Educational Corruption in Higher Education: The Case of Ukraine

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Abstract

Educational corruption is a relatively new area of study in economics due mainly to the lack of available data. This paper utilizes a unique data set to examine educational corruption of various types including bribing on exams and term papers as well as bribing to obtain credits and bribing to enter educational institutions. The data was gathered from 1588 students attending educational institutions throughout Ukraine. The paper attempts to identify the determinants of bribery across various institutions and cities throughout Ukraine. The results reinforce the importance of corruption perceptions and the relationship they have with actual bribing behavior. The paper concludes that women tend to have a higher probability of bribing on exams and for entrance after controlling for job market perceptions. The results also suggest that students whose fathers are in agriculture have a higher probability of bribing compared to students with fathers in the private or entrepreneurial sector. Bribing during secondary school is also a strong predictor of bribing on term papers and for entrance to tertiary school. Finally, a student's opinion on the act of bribing stands out as a significant determinant of bribing on exams, for entrance, and for credit.

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1 Introduction

Educational corruption has come to the forefront of economic research as recent data about this new concept has emerged. This paper includes an empirical study on the determinants of bribery in higher educational establishments throughout Ukraine. Although this paper concentrates on the problem of educational corruption in one country, it should be noted that this is a world-wide problem as presented by *The Chronicle of Higher Education* ("Corruption Plagues Academe," 2002). Problematic levels of educational corruption have been reported in China, Colombia, Russia, Georgia, New Zealand, Nigeria, Thailand, Afghanistan, and Kenya.[1] Various types of educational corruption have been reported including but not limited to bribing on entrance exams, bribing to pass exams, and paying for degrees. MacWilliams (2002) describes one instance when a professor of a Georgian school actually distributed a price list for various types of bribes to his students.

The first step to exploring educational corruption is to define it. Heyneman (2004) defines educational corruption as: "the abuse of authority for personal as well as material gain". Educational corruption is not solely for material gain because it also includes gains from personal advancement such as an increase in social status. Students may use bribing as a way of avoiding the selection mechanisms or quality measures in place to distinguish themselves from their fellow students with the expectations of some current or future gain. More specifically, we define educational corruption to include bribing on exams, term papers, to pass classes (credits), and to enter an institution. Bribes can take the form of money, favors, or gifts.

Rumyantseva (2005) develops a taxonomy of educational corruption. She finds that two main types of educational corruption exist. One type that involves students directly and the type that indirectly impacts the student. She stresses the importance of the first type of corruption because it has the potential to impact the student's opportunities, values, and beliefs. If corruption in education is the first place in which the student is involved directly with corruption, then its reduction is of great importance as it shapes the students' beliefs and attitudes outside of the time spent in school. Thus, the reduction of educational corruption could have important spill over effects into other sectors of the economy. If students are taught that corruption is acceptable and even a way of life at early stages of adulthood,

[1] For a review of cases of educational corruption around the world, see Rumyantseva (2004).

they may be more inclined to carry this behavior over to all aspects of life. Corruption in education may then be the birthplace of corruption throughout an economy.

The other type of educational corruption does not necessarily involve the student directly but has an indirect effect. Rumyantseva (2005) gives and example of this type with a case of a school administrator embezzling money from an educational institution. By embezzling money, less resources are available to the student body thus impacting them indirectly. In this paper we focus on the type of educational corruption which involves the student directly.

The paper begins by introducing the motivation behind studying educational corruption and then continues with a short literature review. The paper then uses an econometric framework to provide a foundation for studying educational corruption. Finally, the paper reviews the empirical findings, interprets the results, and offers the appropriate policy recommendations.

1.1 Motivation

Educational corruption is of interest because it allows the student to bypass quality and selection metrics that are in place within educational institutions. Quality of education is important because it determines the quality of the labor force and therefore has impacts on productivity and innovation for a country. Hanushek and Kim (1995) explore the importance of the quality of labor force and its impacts on economic growth and find a positive and significant relationship with economic growth for a cross-section of countries. Using international test scores to obtain a quality index, they find that a one standard deviation in measured cognitive skills translates into a percentage point difference in the average growth rate. Their results are robust to model specification and lead to increased precision in the prediction of average growth rates for the sample used. Their results present strong evidence to support the important relationship between educational quality and economic performance. Educational corruption may deteriorate the quality of education thus inhibiting economic growth.

The degree to which corruption in education deteriorates the quality of the labor force is dependent upon the path of the student and how the skills acquired in school relate to the job of the student. If the job a student takes after graduation requires a rigorous understanding of the tools taught, then bribing to pass exams or obtain credits may have a significant impact on the productivity of a particular student or industry as a whole. However, if a student's educational training contributes little to the student's occupational

choice, then the effects of bribing in school could be negligible. This point then suggests that the impacts of educational corruption on productivity are determined by the match between a student's training and his or her occupation.

Fershtman, Murphy, and Weiss (1996) explore the relationship between social status, education, and economic growth and find that while social status plays an important role in the allocation of talent; its role may lead to decreased economic performance. Professions carrying high levels of status tend to draw people of all types of ability. Talent may be misallocated because people with high wealth levels have access to "high quality" institutions or specialized training that allows them to be employed in high status positions regardless of their ability. Furthermore, if those high wealth individuals are of low-ability, then there may be a negative impact on economic growth if those high status industries are growth-enhancing. The optimal allocation of talent would allocate the high-ability individuals to growth-enhancing industries regardless of their wealth. Schools have the ability to achieve this if they are operating effectively. We do not argue that the misallocation of talent does not occur in countries without educational corruption, only that this process is accelerated in countries that do have corruption in education. Thus educational corruption inhibits educational establishments' ability to act as a filter by allowing high wealth low-ability students to enter institutions that have better connections to positions of high status. The results of Fershtman et al. (1996) reveal another path in which educational corruption could be detrimental to economic performance.

Heyneman (2004) supports the argument that educational corruption destroys the selection method that can be created by educational establishments. Klitgaard (1986) and Pinera and Selowsky (1981) attempt to quantify the impacts of the misallocation of talent on economic performance finding that developing countries could improve their per capita gross national product by five percentage points if they were to base their leadership upon merit as opposed to gender or social status.

2 Literature Review

While the bulk of the literature that explores bribing does not touch on educational corruption, it offers an important foundation to begin studying it. Cabelkova and Hanousek (2004) study corruption perceptions and willingness to bribe throughout various sectors of Ukraine, including educational establishments. Their sample includes both students and non-students and

sheds some light on what determines both corruption perceptions and the willingness to bribe. They find that corruption perceptions strongly determine the willingness to bribe across institutions, including educational establishments. The authors show that as the degree of corruption perceptions increases, so does the willingness to bribe. They also discover a relationship between occupation and willingness to bribe. Their results suggest that business people, retirees, and peasants all have a higher propensity to offer a bribe at educational establishments. They find an inverse relationship between age and willingness to bribe, a finding that is due to the fact that a person's interaction with educational establishments is likely to decrease through time on average. Finally, their results show no relationship between gender and willingness to bribe at educational establishments.

Swamy, Knack, Lee, and Azfar (2000) explore the determinants of bribery at both a macro and microeconomic level. They investigate the relationship between corrupt behavior and gender, and find that at a macro level, countries with a larger share of parliamentary seats held by women tend to have lower levels of corruption. They also find that countries with a greater proportion of women in the labor force tend to have lower levels of corruption. On a micro-level, they discover that firms that are run by women tend to bribe less than those run by men. They conclude that in the short to medium run, introducing more women into public life has the potential to reduce corruption. Mocan (2004) also finds a relationship between corruption and gender concluding that men are more likely to be asked for a bribe.

Hauk and Sáez (1999) explore the relationship between culture and corruption using an overlapping-generations approach. The authors find that in a theoretical framework, corruption in the children can be reduced through corruption education programs. The effectiveness of the education on corruption reduction is dependent upon the parents' effort exerted towards their children as well as the ethical structure of society. Therefore, the role of the parent in reducing corruption in their children is vital. A parent exhibiting corrupt behavior will tend to raise a corrupt child. This is a particularly important aspect of educational corruption, because there may be a link between the parents' level of corrupt behavior or corruption perceptions and those of their child. Thus the parent's corrupt behavior may influence the child's behavior at his or her educational establishment. This relationship will be tested in this paper through the occupation of the respondent's parent in an attempt to identify any relationship between the parent's occupation and the student's behavior or perceptions in his or her educational establishment.

3 Data Description

The data used in this paper was obtained from a 2003 survey conducted by A Partnership for a Transparent Society. The survey included 1588 respondents covering 12 cities throughout Ukraine. The survey includes questions that pertain to perceptions of corruption as well as actual levels of bribes associated with higher educational establishments (tertiary school). The respondents are either first or second year students at Ukrainian colleges, universities, technical schools, institutes, or academies. Students' perceptions teachers who except bribes, their job market prospects, past bribing behavior, academic honors at secondary school, and parents' occupation are also included in the data.

One potential problem presented by the data is the non-response category. One way of dealing with this problem is to throw out observations that exclude a response for a given question, but this leaves out characteristics of the respondents that may reveal some valuable information. If the number of missing answers for a question is low, then leaving those observations out will have little or no effect on the analysis. Another way of dealing with this problem is to account for the missing answers in the form of a dummy variable. For example, if a respondent does not feel comfortable revealing his or her father's profession, then a dummy variable would be assigned to that respondent, one meaning missing answer, zero meaning an answer was given. This reveals characteristics of respondents even if there is a large portion of missing answers for a particular question. The results presented in this paper combine the missing answers with "hard to say" responses in most cases because the analysis does not change when those observations are included separately as a result of their low frequency in the data set.

Table I contains descriptive statistics which reveal that 56% of students bribed to enter their educational establishment, 22% bribed to pass exams, 18% bribed for credit, and 5% bribed on term papers. Over 35% of students felt their educational establishment was "very corrupt" or "rather corrupt" while 48% of students viewed teachers that accept bribes as "corrupt", "criminal", or as "bribe-takers". Finally, 27% of students bribed on their final exams during secondary school.

3.1 Data Transformations

To make the regressions more interpretable, we employed various data transformations. To account for city effects, we grouped the data by city size, following a study conducted by Cabelkova and Hanousek (2004). Cities

were broken into four sizes according to population. The four groups are big cities, large cities, medium cities, and small cities. Big cities are defined as having populations over 500,000, and large cities with populations between 200,000 and 500,000. Cities with population between 100,000 and 200,000 are categorized as medium cities, leaving cities with populations of less than 100,000 designated as small cities.

Cabelkova and Hanousek (2004) hypothesize that larger cities should increase a respondent's willingness to bribe because large cities lack the social pressure present in smaller cities that may reduce corrupt behavior. Large cities offer more anonymity, helping to facilitate corruption. The entrepreneurial and private sector occupation categories for respondent's parents were combined to form one category as were the unemployed and pensioners. We also collapse corruption perceptions based on whether a student felt their educational institution was very corrupt or rather corrupt versus slightly corrupt, not corrupt, or hard to say. The main reason for this is that using ordered perceptions on a one to five scale offers some problems with interpretation. For example, it is difficult to interpret what "hard to say" means. An ordered setup assumes "hard to say" relays a lower level of corruption perceptions than "not corrupt". We therefore only draw inference on two categories of corruption perceptions.

We also include a variable that describes the respondent's sentiment towards the act of bribery. If the student feels as if the person accepting the bribe is a "criminal", a "bribe-taker", or "corrupt" then we assume that the respondent feels as if the act of bribing is a crime. If the student views teachers who accept bribes as "forced to", or as "business people" we characterize these students who don't see bribing as a crime but as a business decision or something that is out of the teacher's control. The remaining respondents have no clear view of how they characterize teachers that accept bribes.

The data set includes the job market perceptions of the respondents which we see as an important variable. If a student sees his job market prospects as poor he may be more inclined to offer a bribe. This could occur as the student wishes to differentiate himself from his graduating cohort. This variable takes on four different values: "the majority of students get a job", "expects to get a good job", "hard to say", and it will be "hard to get a job". We combine "good job" and "majority get a job" responses into one group leaving the "hard to get a job" as the group for comparison.

We also include whether a student received a gold medal when graduating from secondary school. This is equivalent to graduating with honors from high school in the United States. This is used as a control to find a

correlation between the best students in high school and their behavior at tertiary school to determine if the "best students" by conventional measures are engaging in corrupt behavior. This interpretation, however, is assuming that the students who obtained a gold medal did not bribe to get it.

Finally, students also responded to whether or not they bribed on their final exams during secondary school. This variable is also included in the analysis because it allows us to measure the impact past behavior may have on current behavior.

4 Methodology

In order to address the impacts of the previously discussed variables on the probability of bribing across various categories of bribing we would ideally use a probit model. The general model to be tested is as follows:

$$\begin{aligned} BRIBECAT = {} & \beta_{10} + \beta_{11}PERCEPT + \beta_{12}LARGCITY + \beta_{13}MEDCITY \\ & + \beta_{14}SMLCITY + \beta_{15}NOFATNA + \beta_{16}NOTWORKING \\ & + \beta_{17}FSE + \beta_{18}FAGR + \beta_{19}CULTWORKER + \beta_{110}GOLDY \\ & + \beta_{111}GOODJOB + \beta_{112}HARDSAY + \beta_{113}BRFINY + \beta_{114}FEMALE \\ & + \beta_{115}AGE19UP + \beta_{116}AGE1719 + \beta_{117}NOCRIME + \beta_{118}NOTSURE \\ & + u \end{aligned} \tag{1}$$

Where BRIBECAT represents the category of interest such as bribing on an exam, to enter an educational institution, pass a term paper, or for credit. One problem to address immediately is the fact that Equation (1) may suffer from endogeneity bias. This endogeneity can be caused by either omitted variable bias or simultaneity bias, both of which result in inconsistent estimation under ordinary probit analysis. The simultaneity bias that could be present may be a result of joint determination of perceptions and actual behavior. For example, if a person is more likely to believe his school is corrupt they may as well be more likely to bribe. However, this may run both ways as a student bribes more they may have an increased probability of believing their school is corrupt. Therefore, estimation under this theoretical formulation should follow a system completed by the following equation:

$$
\begin{aligned}
PERCEPT = {} & \beta_{20} + \beta_{21} BRIBECAT + \beta_{22} LARGCITY + \beta_{23} MEDCITY \\
& + \beta_{24} SMLCITY + \beta_{25} NOFATNA + \beta_{26} NOTWORKING \\
& + \beta_{27} FSE + \beta_{28} FAGR + \beta_{29} CULTWORKER + \beta_{210} ACAD \\
& + \beta_{211} COL + \beta_{212} INST + \beta_{213} TECH + \beta_{214} GOODJOB \\
& + \beta_{215} HARDSAY + \beta_{216} BRFINY + \beta_{217} GOLDY + \beta_{218} FEMALE \\
& + \beta_{219} AGE1719 + \beta_{220} AGE19UP + \beta_{221} NOCRIME + \beta_{222} NOTSURE \\
& + v
\end{aligned} \tag{2}
$$

Combining Equations (1) and (2) would result in a system of equations that could capture the simultaneous determination of corruption perceptions and actual bribing behavior. While estimation of this system would seem ideal theoretically, it is often problematic in practice. The main problem that presents itself is that of identification. In order to correctly identify one equation from the other one needs a valid instrumental variable (IV) that is excluded from either Equation (1) or (2). We choose to search for an instrumental variable for corruption perceptions such that Equation (1) can be identified producing consistent estimators.

In the search for an instrumental variable papers often combine statistical correlations and intuitive and quite often creative arguments. The typical problem presented here is to find a variable that is correlated with corruption perceptions but uncorrelated with the error term in Equation (1). One variable that could potentially satisfy these conditions is the type of educational establishment a student attends. This argument requires some discussion.

In Ukraine, the type of institution attended is generally determined by the income of the parent. This can be roughly verified by briefly discussing some of the bribe amounts required to enter specific institutional types. The average bribe to enter a university or an academy is \$1600, \$1400 for an institute, \$750 for a college, and \$250 to enter a technical school. We can see that each type of institution requires a different size bribe. Therefore, one can think of each type of institution as being correlated with income. While the data does not specifically contain income information the data seems to suggest that bribes come in other forms than money. For example of those who bribed on their final exams in secondary school only 27% them bribed in the form of money. Of the remaining students, 53% bribed with presents, 4% with agricultural products, 14% with favors, and 2% with other. Therefore, income may not be the only variable that impacts a student's propensity to bribe across certain categories when they have other available resources

they can use. Furthermore, including the father's occupation may in-fact capture some of the income variation among the respondents. Although this is subject to measurement error, it may capture enough information to rule out the potential endogeneity of type of school attended.

Fortunately, the validity of this argument can be tested statistically in the presence of overidentification, which occurs when the number of instruments exceeds the number of endogenous variables. As presented by Baum, Schaffer, and Stillman (2002)we use use Hansen's J-statistic which is calculated under feasible efficient two-step GMM and is robust to heteroskedasticity:

$$J(\hat{\beta}_{EGMM}) = \hat{u}Z'(Z'\hat{\Omega}Z)^{-1}Z\hat{u}' \overset{\text{A}}{\sim} \chi^2_{L-K} \tag{3}$$

The test of correlation of corruption perceptions can be easily tested by regressing corruption perceptions on all exogenous variables and testing the joint significance of the IV in question. Using a linear probability model (LPM) the F-test from the test of joint significance for the type of institution is 5.30 which suggests significance at the less than one percent level. While this test suggests the IV in question may be suitably correlated with the endogenous variable, it should be viewed with caution. Staiger and Stock (1997) caution against using variables that are weakly correlated with endogenous variables, finding that, in nonlinear GMM, weak instruments correspond to weak identification of some or all of the unknown parameters. They also find that weak identification leads to test statistics with non-normal distributions, even in large samples, so that conventional IV or GMM inferences are misleading. Furthermore, Cruz and Moreira (2005) show that the finite sample bias inherent in IV estimators is exacerbated in the presence of weak instruments. Staiger and Stock (1997) suggest a first-stage F-stat of 10 as an indication of good instruments.

Fortunately, Cruz and Moreira (2005) describe certain methods that can be employed that lead to more reliable test statistics and confidence intervals under the presence of weak identification. We will employ linear IV methods because it is the only way known to the authors in which corrections under weak instrumentation can be implemented.

To establish more robust inference we will employ both the Anderson-Rubin (AR) statistic and the conditional Wald-test (CWT) as presented in Cruz and Moreira (2005):

$$AR = S'(Z'Z)^{-1}S/\sigma_0^2 \overset{\text{A}}{\sim} \chi^2_K \tag{4}$$

$$W = (b_{2SLS} - \beta_0)' y_2' N_z y_2 (b_{2SLS} - \beta_0)/\hat{\sigma^2} \overset{A}{\sim} \chi_1^2 \quad (5)$$

Where the CWT is distributed as chi-square-one under good instruments.

The first step to potentially having to correct for endogeneity is to test for it since correcting for endogeneity does not come without a cost. The typical IV estimators are less efficient than OLS and not without finite sample bias. Therefore, we use the Hausman (1978) specification test in an attempt to detect any endogeneity in our suspect variable. We utilize both the Durbin-Wu-Hausman and Wu-Hausman tests for endogeneity as presented in Baum et al. (2002). The results are presented in Table II.

The results in Table II suggest that corruption perceptions should be handled as exogenous in the entrance bribe equation but as endogenous in the remaining equations. A potential reason for the exogeneity of corruption perceptions is the fact that the entrance bribe was made prior to the student actually attending. Therefore, a student's perceptions of corruptions should not be jointly determined when calculating the impact perceptions have on bribing to enter. Thus, the entrance bribe equation will be estimated via probit. The remaining equations will be estimated by IVLPM in anticipation of weak instruments. As mentioned above, we can obtain valid confidence intervals under weak instruments using a IVLPM, but to the author's knowledge, this is not available using probit IV estimation. Although the downside to LPMs are well documented, LPMs provide very good estimates of the partial effects on the response probability near the center of the distribution Wooldrige (2002).

5 Results

The results for exam equation for both 2SLS and IVProbit are reported in Table III. The results under IVProbit estimation are scaled in order to serve a rough comparison with the 2SLS estimates. The results suggest that females have a higher probability of bribing as compared to males. This result is significant at the 5% level under both forms of estimation. An important result seems to be that job prospects have no impact on the probability of bribing. The city effect is not as expected as a result of the smallest city students have a higher probability of bribing when compared to the biggest city cohort. In the exam equation, bribing on final exams during secondary school does not have a statistically significant impact on a students probability of bribing on exams. This suggests, that past bribing behavior is not a predictor of bribing on exams. Students whose fathers

are in agriculture or state employees have a higher probability of bribing on exams when compared to students whose fathers are in the private or entrepreneurial sector. These results compare favorably to those presented in Cabelkova and Hanousek (2004) as they found peasants have a higher willingness to bribe. Students who view teachers who accept bribes as forced to do so or see them as business people are 8%(9%) more likely to bribe than those students who view teachers who accept bribes as corrupt or criminal under 2SLS (IVProbit) estimation. This result is significant at the 5% level under both estimation methods. Perceptions of corruption prove to be of importance as those who think their institution is very or rather corrupt are 61% more likely to bribe on an exam. The IV probit estimation suggests a larger effect of 79%. Both estimates are statistically significant at the 5% level.

Hansen's J-stat fails to reject the null of the instrument list exogeneity in the exam questions adding robustness to the results. The confidence intervals for both the CWT and the AR are reported under the traditional 95% confidence intervals. Both alternative tests suggest that the coefficient on perceptions is statistically different from zero at the 5% level. Thus, the results reported in Table III are robust to weak instruments. Figure 1 is a graphical representation of the CWT. The CWT, having a critical value *function*, shows a distribution to the right of the traditional Wald-test suggesting a greater impact of corruption perceptions than those reported by 2SLS. The most important aspect of the CWT is the fact that the coefficient on PERCEPT is bounded from zero.

Figure 2 is a graphical representation of the AR-test which also hints at a mean beta to the right of the 2SLS estimates. The AR-test also shows that the estimate under weak instruments is again bounded from zero.

Table IV reports the 2SLS and IV probit results for the credit equation suggesting that the city effects are once again ambiguous. Students who live in small cities tend to have a higher probability of bribing than those students living in the biggest cities, while the opposite is true for students who live in medium and large cities. Past behavior does not seem to play a role in the credit equation, however students whose fathers are in agriculture are more likely to bribe than those students who have fathers in the private or entrepreneurial sector. Those students who see teachers who accept bribes as forced to or as businesspeople are approximately 10% (12%) more likely to bribe for credit than those students who see teachers who accept bribes as criminals or bribe-takers under 2SLS (IVProbit). Perceptions are important in the credit equation which can be seen from the coefficient reported. Those students who felt their institution was very corrupt or rather corrupt are

54% more likely to bribe for credit. The effect is significantly greater when examining the IV probit estimate of 74%. Both estimation methods produce perceptions estimates significant at the 5% level.

Hansen's J-stat supports the assumption that the IVs are exogenous in equation 1 thus lending support to the estimates. Furthermore, both the AR-test and CWT suggest that the estimate for perceptions is statistically different from zero under weak identification. Figures 1 and 2 display the CWT and AR-test, graphically hinting that the true estimate of perceptions may be to the right of the 2SLS estimate.

Table V reports the results from the term paper equation, suggesting that those students who felt as if their job prospects are unclear or "hard to say" are less likely to bribe than those who believe their future job prospects are difficult; the 2SLS (IVProbit) estimate is .04 (.10). The city effects are ambiguous with both students who live in large and small cities having a higher probability of bribing on a term paper. Past bribing behavior seems to be an important determinant of bribing on a term paper. Those who bribed on final exams during secondary school are 8% more likely to bribe than those who did not. The student's view of those who accept bribes plays a small role against bribing on term papers. Corruption perceptions are negatively correlated with bribing on a term paper but only at the 10% level as estimated by 2SLS. The IV probit estimate is also negative but larger in magnitude as well as significant at the 1% level. However, these results could be suspect under weak identification.

Looking at the AR-test and CWT suggests that the perceptions estimate, after correcting for weak identification, is not statistically different from zero at the 5% level.[2] Therefore, corruption perceptions play no role in the determination of bribing on a term paper. The Hansen J-stat reported also supports the assumption that the instrument list used is exogenous.

Table VI has the unscaled results from the entrance bribe equation. The results suggest that females are more likely to bribe for entrance. This result is significant at the 1% level. Those students who believe that their job prospects are good versus those who view their prospects as difficult are 9% less likely to bribe for admissions. Those students who live in large cities are less likely to bribe than those students living in the biggest cities. Students who bribed on their final exams during secondary school are 18% more likely to bribe for entrance. Those students who view the behavior of teachers accepting bribes as "business people" or as "forced to accept" bribes are 9% more likely to bribe than the control group. The estimated

[2]For a graphical representation see Figures 3 and 4.

impact of perceptions on a students probability of bribing is positive and significant at the 1% level.

6 Conclusion

This paper attempts to identify the determinants of bribery in Ukraine's higher educational establishments. Bribing behavior of students at secondary school seems to predict corrupt behavior at tertiary school for entrance bribes and term paper bribes. This suggests that a potential approach to curbing educational corruption in tertiary schools may be to first combat it at the secondary level.

Cabelkova and Hanousek (2004) find that business people have a higher willingness to give a bribe because they are more likely to benefit from corruption. When compared to business people or entrepreneurs, students with fathers in agriculture have a higher probability of bribing on exams and for credit. Why this is the case is not known.

Corruption perceptions are found to be highly significant and positively correlated with actual bribing behavior across three of the four types of bribes. This result is consistent with the work presented by Cabelkova and Hanousek (2004) as they found that perceptions of corruption are strong determinants of a person's willingness to bribe. This has important implications for policy, as it suggests that just by lowering the perceptions of corruption actual behavior can be significantly influenced. Therefore, when enforcement of bribe control is difficult, it may be wise to shape the perceptions of the population in question in an attempt to reduce corruption indirectly.

The student's opinion on the act of bribing is a strong determinant of bribing across three of the four categories of bribes. This suggests that shaping the student's perceptions of the act of bribing may be an effective policy in the reduction of educational corruption. A natural policy recommendation would then be to first criminalize the act of bribing in the minds of the students. From the results presented in the paper, this should have real impacts on the level of actual corruption within educational institutions.

An additional result found in this paper is that women have a higher propensity to bribe to enter an establishment and to bribe on exams. This result is at odds with the literature suggesting that women are less corrupt than men. One potential explanation for this is the fact that women in Ukraine have faced deteriorating labor market conditions over the transition period as described by Brainerd (2000). As female students perceive their

job market prospects as being lower, they may bribe to ensure entrance into top schools or obtain top grades in order to further differentiate themselves in a discriminatory labor market. While this argument makes intuitive sense, the results suggest a different solution.

If womens' job market perceptions were the sole explanation for females' increased propensity to bribe for entrance or on exams, then the female dummy variable should not be significant after controlling for job market perceptions. The results show that this is not the case. Therefore, there must be another explanation for womens' increased propensity to bribe. Another potential explanation could be discrimination against women in educational institutions . If it is harder for women to succeed in an educational environment, they may have to bribe to compete with fellow classmates or for entrance into an educational establishment. Unfortunately, this explanation is hard to prove, but makes for an interesting topic for future research.

The results offer little support for the argument posed by Cabelkova and Hanousek (2004) suggesting that larger cities should experience higher levels of corruption as a result of greater anonymity, and therefore, lower levels of social pressure to act morally. The evidence in this paper offers no clear pattern to support this argument when examining corruption in education.

The paper has identified various determinants of actual corruption and in the higher educational institutions of Ukraine. Perceptions, the occupation of the father, perceptions of the act of bribing, past behavior, and even gender stand out as clear determinants. While this study focuses only on one country, the results can be used as a basis for studying educational corruption in countries around the world. By reducing corruption in education, countries can experience increased economic growth through more efficient allocation of talent and a greater quality of the labor force. This should serve as sufficient motivation for future research into this topic.

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Table I		
Variable	**Variable Description**	**Mean**
ENTER	1 if bribed to enter	0.56
EXAM	1 if bribed on exam	0.22
CREDIT	1 if bribed for credit	0.18
TERM	1 if bribed on a term paper	0.05
PERCEPT	1 if student believes EE to be very or rather corrupt	0.36
BIGCITY	1 if pop. of city is >500,000	0.51
LARGCITY	1 if pop. of city is < 500,000 but > 200,000	0.24
MEDCITY	1 if pop. of city is < 200,000 but > 100,000	0.06
SMALLCITY	1 if pop. of city is < 100,000	0.19
FENTPRIV	1 if student has a father in private or entreprenurial sector	0.29
NOFATNA	1 if student has no father or NA	0.09
NOTWORKING	1 if father is not working	0.10
FSE	1 if father is a state employee	0.18
FAGR	1 if father is in agriculture	0.06
CULTWORKER	1 if father is a cultural worker	0.28
UNIV	1 if school is a university	0.43
ACAD	1 if school is an academy	0.10
COL	1 if school is college	0.05
INST	1 if school is institute	0.19
TECH	1 if school is a technical school	0.23
GOODJOB	1 if student believes job prospects are good	0.27
HARDSAY	1 if student believes it is hard to say on job prospects	0.36
DIFFJOB	1 if student believes job prospects are difficult	0.37
BRFINY	1 if student bribed on final exams during secondary school	0.27
GOLDY	1 if student graduated with a gold medal from secondary school	0.16
FEMALE	1 if student is female	0.59
AGE17UN	1 if student is age under 17	0.06
AGE19UP	1 if student is age 19 up	0.20
AGE1719	1 if student is btwn. 17 and 19 years old	0.74
CRIME	1 if sees bribing as a crime	0.48
NOCRIME	1 if sees bribing as no crime	0.34
NOTSURE	1 if not sure of bribing as a crime	0.18

Table II: Tests of endogeneity of percept				
H0: Regressor is exogenous				
	Exam	Enter	Term	Credit
Wu-Hausman F-test:	4.830	2.453	5.400	5.552
P-value	0.028	0.117	0.020	0.019
Durbin-Wu-Hausman chi-sq-test:	4.876	2.481	5.450	5.603
P-value	0.027	0.115	0.020	0.018

Table III: 2SLS vs IVProbit Exam Results					
Independent Variables	β_{SLS}	$\beta_{ivprobit}$	*Independent Variables*	β_{SLS}	$\beta_{ivprobit}$
female	0.051	0.062	fagr	0.12	0.142
	(0.023**)	(0.029**)		(0.052**)	(0.056***)
goodjob	-0.004	0.007	fse	0.066	0.086
	(0.036)	(0.042)		(0.037*)	(0.039**)
hardsay	0.035	0.055	notworking	0.061	0.079
	(0.034)	(0.035)		(0.045)	(0.049)
age1719	-0.053	-0.063	cultworker	0.027	0.036
	(0.048)	(0.054)		(0.03)	(0.035)
age19up	-0.102	-0.119	nofatna	0.023	0.016
	(0.053*)	(0.061**)		(0.044)	(0.052)
largcity	-0.063	-0.076	nocrime	0.078	0.091
	(0.029**)	(0.033**)		(0.025***)	(0.032***)
medcity	0.003	-0.021	notsure	0.092	0.122
	(0.056)	(0.063)		(0.042**)	(0.038***)
smallcity	0.099	0.111	goldy	0.028	0.016
	(0.033***)	(0.035***)		(0.033)	(0.016)
brfiny	-0.014	-0.038	_cons	-0.062	-0.607
	(0.041)	(0.044)		(0.101)	(0.071***)
			percept	0.605	0.785
				(0.206***)	(0.106***)
Sargan Statistic:	3.967		**percept**		
P-value:	0.265		95% Conf. Int.	[.20, 1.01]	
Hansen J-stat:	3.691		Cond. Wald Conf. Int.	[.25, 1.47]	
P-value:	0.297		AR Conf. Int.	[.16, 1.96]	

Table IV: 2SLS vs IVProbit Credit Results					
Independent Variables	β_{SLS}	$\beta_{ivprobit}$	*Independent Variables*	β_{SLS}	$\beta_{ivprobit}$
female	0.004	0.007	fagr	0.135	0.160
	(0.022)	(0.027)		(0.049***)	(0.056***)
goodjob	-0.025	-0.023	fse	0.002	0.005
	(0.034)	(0.048)		(0.035)	(0.047)
hardsay	-0.010	0.002	notworking	0.067	0.089
	(0.033)	(0.044)		(0.043)	(0.048*)
age1719	-0.038	-0.051	cultworker	0.022	0.028
	(0.046)	(0.055)		(0.028)	(0.035)
age19up	-0.091	-0.115	nofatna	0.027	0.027
	(0.050*)	(0.062*)		(0.042)	(0.054)
largcity	-0.087	-0.106	nocrime	0.099	0.116
	(0.028***)	(0.035***)		(0.024***)	(0.036***)
medcity	-0.183	-0.258	notsure	0.073	0.105
	(0.053***)	(0.070***)		(0.039*)	(0.041***)
smallcity	0.077	0.093	goldy	-0.043	-0.063
	(0.031**)	(0.035***)		(0.031)	(0.037*)
brfiny	-0.046	-0.066	_cons	0.009	-0.524
	(0.039)	(0.042)		(0.096)	(0.070***)
			percept	0.537	0.739
				(0.196***)	(0.119***)
Sargan Statistic:	4.647		**percept**		
P-value:	0.200		95% Conf. Int.	[.15, .92]	
Hansen J-stat:	4.688		Cond. Wald Conf. Int.	[.21, 1.43]	
P-value:	0.196		AR Conf. Int.	[.16, 1.84]	

Table V: 2SLS vs IVProbit Term Results					
Independent Variables	β_{SLS}	$\beta_{ivprobit}$	*Independent Variables*	β_{SLS}	$\beta_{ivprobit}$
female	-0.010	-0.028	fagr	-0.023	-0.053
	(0.013)	(0.034)		(0.029)	(0.073)
goodjob	-0.003	-0.017	fse	-0.010	-0.038
	(0.020)	(0.049)		(0.021)	(0.052)
hardsay	-0.037	-0.101	notworking	-0.006	-0.014
	(0.019*)	(0.040**)		(0.025)	(0.062)
age1719	0.014	0.032	cultworker	0.004	0.005
	(0.027)	(0.070)		(0.017)	(0.044)
age19up	0.037	0.103	nofatna	0.000	-0.009
	(0.030)	(0.077)		(0.025)	(0.071)
largcity	0.052	0.135	nocrime	0.007	0.026
	(0.017***)	(0.045***)		(0.014)	(0.037)
medcity	0.011	0.012	notsure	-0.052	-0.141
	(0.032)	(0.099)		(0.024**)	(0.052***)
smallcity	0.058	0.126	goldy	-0.002	-0.011
	(0.019***)	(0.068*)		(0.018)	(0.049)
brfiny	0.082	0.200	_cons	0.090	-0.329
	(0.023***)	(0.036***)		(0.057)	(0.231)
			percept	-0.195	-0.549
				(0.117*)	(0.161***)
Sargan Statistic:	1.553		**percept**		
P-value:	0.670		95% Conf. Int.	[-.424, .034]	
Hansen J-stat:	1.626		Cond. Wald Conf. Int.	[-∞, .004]	
P-value:	0.653		AR Conf. Int.	[-1.01, .13]	

Table VI: Probit Enter Results			
Independent Variables		*Independent Variables*	
female	0.161	fagr	-0.009
	(0.067***)		(0.144)
goodjob	-0.216	fse	-0.113
	(0.085***)		(0.099)
hardsay	-0.039	notworking	-0.017
	(0.078)		(0.122)
age1719	-0.121	cultworker	-0.030
	(0.141)		(0.088)
age19up	-0.125	nofatna	0.085
	(0.154)		(0.128)
largcity	-0.414	nocrime	0.226
	(0.081***)		(0.074***)
medcity	0.244	notsure	0.051
	(0.151)		(0.093)
smallcity	-0.064	goldy	-0.041
	(0.090)		(0.093)
brfiny	0.443	_cons	0.008
	(0.077***)		(0.175)
		percept	0.499
			(0.071***)
LR chi2(18)= 162.14	Prob>chi2=0	Pseudo R2=.08	

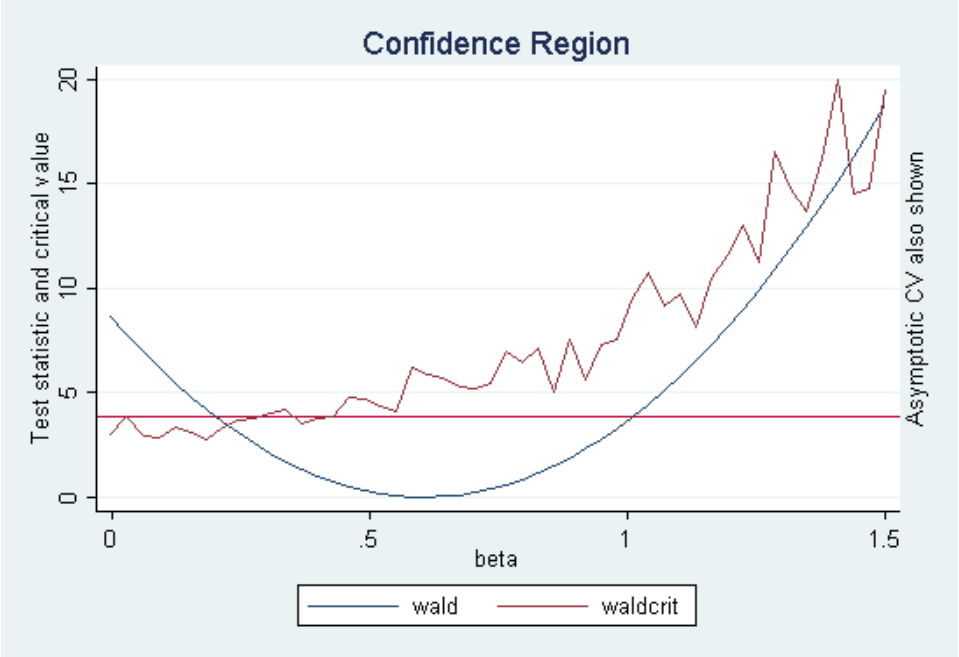

Figure 1: Conditional Wald Test Statistic and Critical Values for percept in Exam Equation

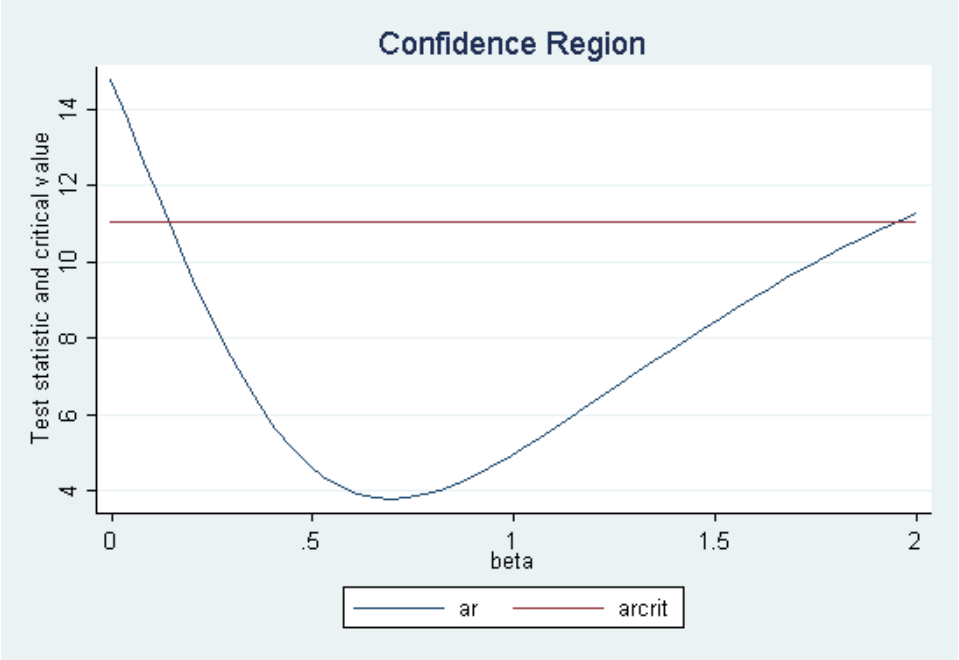

Figure 2: AR Test Statistic and Critical Values for percept in Exam Equation

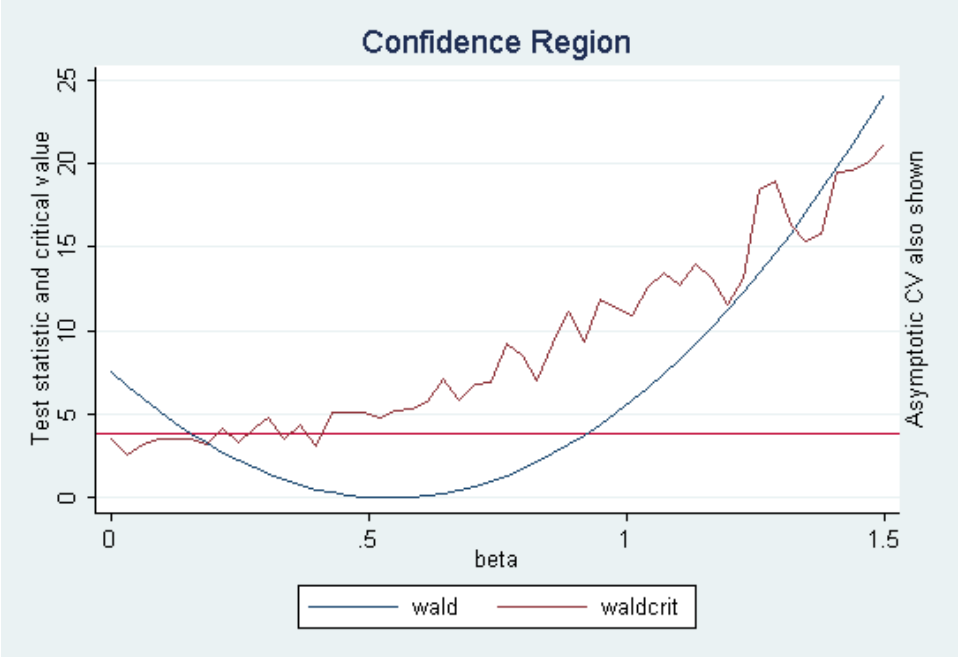

Figure 3: Conditional Wald Test Statistic and Critical Values for percept in Credit Equation

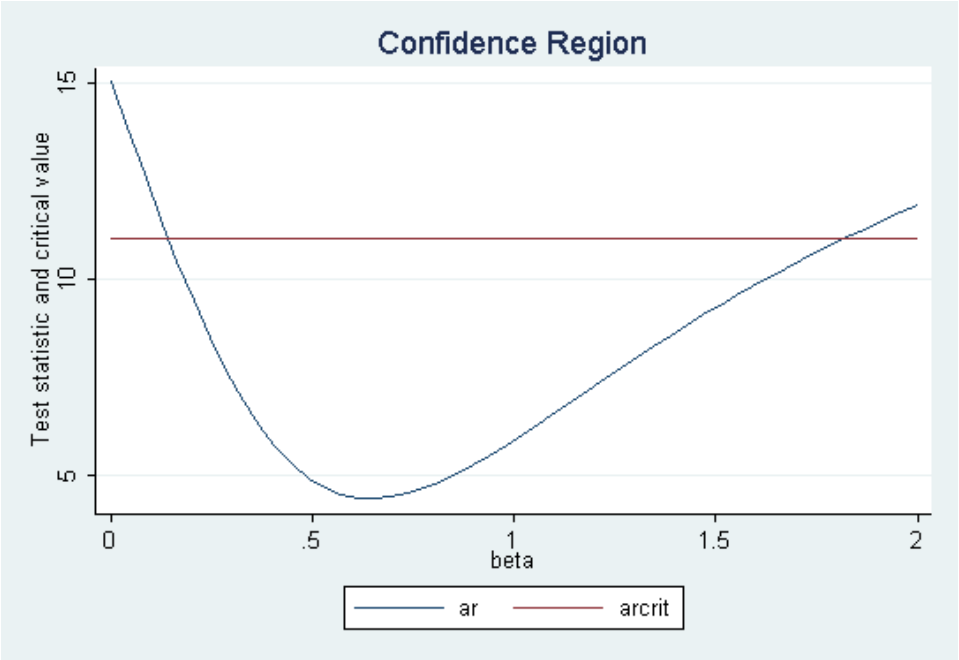

Figure 4: AR Test Statistic and Critical Values for percept in Credit Equation

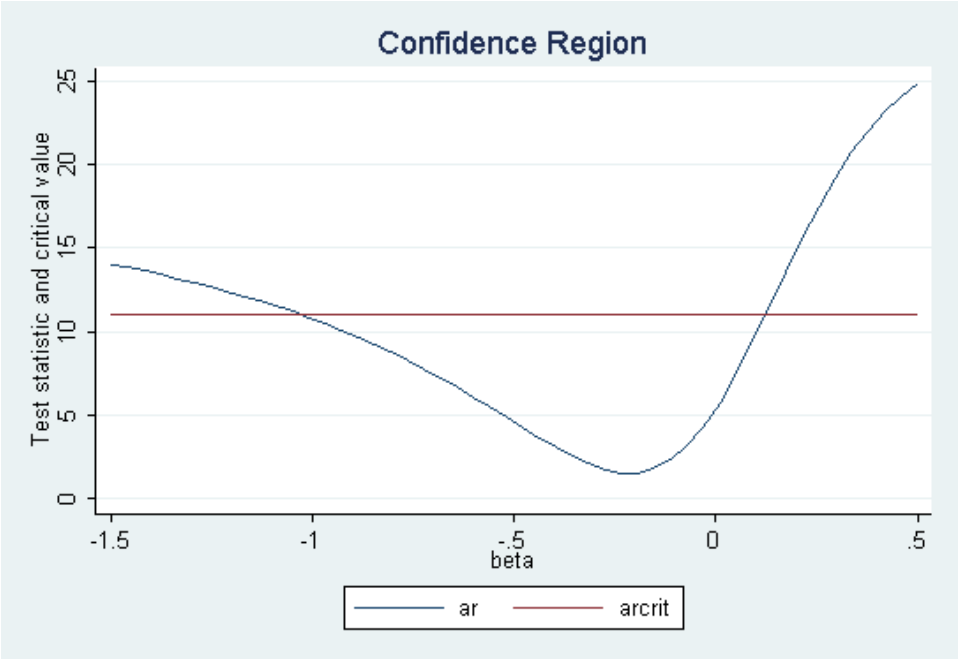

Figure 5: AR Test Statistic and Critical Values for percept in Term Equation