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Why Do Firms Hide?

Bribes and Unofficial Activity after Communism

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Abstract

Our survey of private manufacturing firms finds the size of hidden “unofficial” activity to be much larger in Russia and Ukraine than in Poland, Slovakia and Romania. A comparison of cross-country averages shows that managers in Russia and Ukraine face higher effective tax rates, worse bureaucratic corruption, greater incidence of mafia protection, and have less faith in the court system. Our firm-level regressions for the three Eastern European countries find that bureaucratic corruption is significantly associated with hiding output.

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1. Introduction

A substantial part of output in many developing and post-communist transition economies goes unreported. This “unofficial economy” impedes economic growth in various ways. First, firms operating underground cannot make use of market-supporting institutions like the courts and so may invest too little, as de Soto (1987) argues occurs in Peru. Second, doing business in secret generates distortions because of the effort needed to avoid detection and punishment. Resources that are hidden may not find their highest-value uses, as Shleifer and Vishny (1993) suggest happens in Africa. Third, underreporting costs the government tax revenue that it might otherwise have put to worthwhile use. According to the Latin American evidence of Loayza (1996), a smaller underground sector is associated with higher tax collections, which pay for better public infrastructure and thus lead to faster economic growth.

Why do firms operate in the unofficial economy? The literature offers four explanations of why firms hide, which, while not mutually exclusive, have distinct policy implications. First, entrepreneurs may go underground when statutory tax rates are high and other official regulations are onerous (de Soto 1987, Schneider and Enste 1998). Cutting taxes and red tape are, according to this view, the main ways to bring firms into the official economy. Second, the unofficial economy may be due primarily to predatory behavior by government officials, seeking bribes from anyone with officially registered economic activity (Shleifer and Vishny 1993, 1994, and 1998, Shleifer 1997, Kaufmann 1994 and 1997, Johnson, Kaufmann and Zoido-Lobaton 1998). In this view the problem that needs to be addressed is bureaucratic corruption. Third,

firms might hide some of their output to escape extortion by criminal gangs (Zhuravskaya and Frye, 1998). In this view the remedy is better policing and enforcement of the criminal laws. Fourth, the unofficial economy may result from the inadequacy of the institutional environment. If it is hard to enforce contracts because the courts do not work, a firm gains little from registering its business activity (Marcouiller and Young, 1995, Johnson, Kaufmann, and Shleifer 1997). In this view the state needs to invest in setting up and running a commercial court system to deter unofficial activity.

Most of the existing empirical research on the unofficial economy uses macro data, such as the amount of cash in circulation or electricity consumption. These estimates consistently show countries with inefficient regulatory environments and a great deal of corruption have unofficial activity in excess of 40% of GDP (Johnson, Kaufmann and Zoido-Lobaton 1998, Friedman, Johnson, Kaufmann and Zoido-Lobaton 1999, Schneider and Enste 1998). Post-communist countries offer an opportunity to examine the determinants of unofficial activity because, starting from similar levels of unofficial activity, they have diverged in terms of regulatory environment (EBRD 1997). According to the macro data, the size of the unofficial economy differs greatly between East European countries and members of the former Soviet Union – Johnson, Kaufmann and Shleifer (1997) estimate that in 1995 the unofficial economy in Poland was less than 15% of GDP but in Russia and Ukraine it was around 50%.

This paper investigates the reasons for firms to hide using firm-level data from a survey of similar private manufacturing firms in Poland, Romania, Russia, Slovakia, and Ukraine.¹ The data show the five countries fall into two groups, Russia and Ukraine on the one hand and

¹ Our surveys were undertaken in May and June of 1997 for Russia and Ukraine, and from September to December of 1997 in Poland, Slovakia and Romania. The survey was designed to find similar firms in similar cities in all five countries (and is described in more detail in Johnson, McMillan, and Woodruff, 1998). Our full sample includes about 300 manufacturing firms with between 7 and 370 employees in each country.

Poland, Romania, and Slovakia on the other. The former Soviet countries are more hostile to business than the East European countries by all of our measures. A striking 90% of the Russian and Ukrainian managers say it is normal for bribes to be paid to government officials.

Corruption is less pervasive though not uncommon in the East European countries: in Slovakia 40% say bribes are paid, and in Poland and Romania 20%. The firms suffer extortion not only from bureaucrats but also from criminal gangs. Around 90% of the managers in Russia and Ukraine said firms in their industry pay for “protection” of their activities. In Eastern Europe the mafia is less of a problem: 15% of Slovakian managers, and still fewer Polish (8%) and Romanian (1%) managers, said protection payments are normally made. The firms’ tax payments are higher in Russia and Ukraine than in the other three countries. A cost to the firm of operating outside the formal economy might be that it can rely less on the protection of the courts, which might make it hard to sustain contracts with its trading partners. When asked whether they could use courts to enforce contracts with trading partners, just over a half in Russia and Ukraine said they could, whereas two-thirds or more in Slovakia, Poland, and Romania said they could.

All the firms in our survey are registered firms, so all are in the formal economy, but many of them hide at least some output.² Underreported sales are highest in Ukraine (averaging 41% of total sales) and Russia (29%), and much lower in Slovakia, Romania, and Poland (between 5% and 7%). Managers in Russia and Ukraine, then, face worse bureaucratic corruption, more mafia extortion, higher taxes, and a less effective court system. They also hide more of their output. Comparing averages across the countries, therefore, gives support to all four explanations for hiding.

² Thus we are examining a different aspect of the underground economy than other micro-level studies (such as de Soto, 1989, and Marcouiller and Young, 1995) that focus on firms that are unregistered and so hide all of their output.

In firm-level regressions with the percentage of sales underreported as the dependent variable, we find a significant association between the underreporting of sales and the bribing of corrupt officials. No such association shows in the regressions between underreporting and either protection payments to the mafia, tax payments, or the perceived workability of the courts. These results suggest either that avoiding bureaucratic corruption is an incentive for unofficial activity or that firms that hide their output need to pay bribes. Unfortunately, our data do not allow us to distinguish between these two possibilities.

Section 2 reports in detail our estimates of the average size and distribution of the underreported output in each of the five countries. Section 3 explains the four possible reasons for hiding. Section 4 presents our data on taxation, corruption, and the courts. Section 5 reports firm-level regressions that have the percentage of output hidden as the dependent variable. Section 6 concludes.

2. The Extent of Unofficial Activity

Our total potential sample of interviewees includes 303 firms in Poland, 308 firms in Slovakia, 321 firms in Romania, 269 firms in Russia, and 270 firms in Ukraine. Firms were asked a series of questions about unreported sales and wages and unofficial payments made to government officials. Because of the sensitive nature of the subject, questions were phrased in terms of actions of “typical firms in your industry.”³ Further basic descriptive data about the sample is available in appendices from the authors.

Table 1 shows that the mean level of underreported sales (as a percent of total sales) is

³ For example, the specific questions on hidden sales and wages were prefaced by “It is thought that many firms in your industry, in order to survive and grow, may need to misreport their operational and financial results. Please estimate the degree of underreporting by firms in your area of activity.”

highest in Ukraine (41%), then Russia (29%), then Slovakia (7%), then Romania (6%) and then Poland (5%). The percent of firms saying that no sales are hidden is 74.1% in Poland, 53% in Slovakia, 60.3% in Romania, 32% in Russia, and just 1% in Ukraine. The level of underreporting is similar for salaries (see Table 1) – on average it is a little lower for Russia and Ukraine and a little higher for the three East European countries. Russia and Ukraine have a much lower response rate to the questions about the unofficial economy or about taxation, regulation, and corruption.⁴ Given that we find a much higher level of hidden activity and corruption in Russia and Ukraine, the unwillingness of firms to answer these questions is not a surprise.

Note that our data covers only firms that are at least partially registered. Through omitting firms that are completely unregistered, we are missing a potentially important part of the economy. Presumably, the effects of this omission are more serious in a country like Russia, where there are more reasons to hide. Overall, the effect of this is to bias our estimates of hidden activity downwards where there is more hidden activity.

Table 1 reports t-tests comparing the mean level of unofficial activity (sales or salaries) among the firms in our Polish sample with the mean level among firms in each of the other four countries. The t-tests show no significant differences between Poland and either Slovakia or Romania.⁵ However, the difference between Poland and Russia or Ukraine is highly significant for both sales and salaries.

While all of our sampled firms are privately owned, some had been spun off from state-owned enterprises and others had been newly created. In Russia and Ukraine, managers of spin-off firms say that firms underreport sales to a greater extent than do managers of startups. This

⁴ The response rate for hidden sales was 85% in Poland, 65% in Slovakia, 64% in Romania, 49% in Russia, and 56% in Ukraine.

⁵ We tested for differences in the means between Poland and the other countries.

difference between spin-offs' and startups' propensity to hide sales is significant in both Russia (t statistic of 2.6) and Ukraine (t statistic of 3.2). In Poland, Slovakia and Romania, on the other hand, startups hide a larger percentage of sales and wage payments than do spin-offs, though none of the differences is significant at the country level.⁶

Our estimates of hidden activity may seem large but actually are quite similar to those available from two independent "macro" methodologies.⁷ Lacko's (1996, 1997a, 1997b, 1999) method is based on the household use of electricity beyond simple consumption. She finds the unofficial economy to be 14% of total GDP in Poland, 10% in Slovakia, and 18% in Romania, but much larger in the former Soviet Union: 41% in Russia and 47% in Ukraine. Johnson, Kaufmann and Shleifer (1997) find that unofficial GDP as a percent of total GDP in 1995 was 13% in Poland, 6% in Slovakia, and 19% in Romania. In contrast, they find that the unofficial economy was 42% of GDP in Russia and 49% in Ukraine.⁸

3. Determinants of Unofficial Activity

The literature on the underground economy suggests four possible determinants of unofficial activity. The first three relate to the benefits of being underground, and the fourth to the cost.

⁶ When these three countries are combined, startups hide a significantly larger share of their wage bill (8.5% vs. 5.7%, $t=1.90$). These t-statistics are not shown in the table.

⁷ For details and an assessment see the survey by Schneider and Enste (1998). For post-communist countries they focus on Lacko (1996, 1997a, 1997b) and Johnson, Kaufmann and Shleifer (1998) but the other evidence they discuss for particular countries is consistent.

⁸ In comparing the average amount of underreporting by the firms in our survey with the economy-wide estimates of the size of the unofficial economy, we should note the following. (a) Our surveyed firms are all registered firms, hiding part of their output. We did not survey unregistered firms, all of whose output presumably goes unreported. For this reason the underreporting implied by our survey should be smaller than the economy-wide estimates. (b) Our firms are relatively small. Since it is easier for the government to monitor large firms than small firms, we might expect more underreporting from our surveyed firms than from larger firms. For this reason the underreporting implied by our survey might be larger than the economy-wide estimates.

First, a higher effective tax rate will tend to induce more activity to go underground. In this case, firms hide production and profits simply to reduce their tax burden (Schneider and Enste, 1998). The link between higher marginal tax rates and more tax avoidance is straightforward, but there is a caveat. It is possible that the penalties for tax evasion increase with the amount of unpaid taxes, in which case higher tax rates may not create an incentive to hide (Andreoni, Erard, and Feinstein, 1998).

Second, more corruption will increase the incentive to divert activities underground (Shleifer, 1997). In this case, firms divert activity underground in order to reduce their vulnerability to extortion by government officials. The causality could be reversed, however: the level of corruption could be the outcome of a process in which the firm decides how much to hide and the bureaucrat determines how much to charge. Hiding more may require more bribe payments, and may still be worthwhile if it reduces the total tax plus corruption burden of the firm. In this case, hiding causes bribes, rather than the other way around. In this paper we only able to test for a correlation between the incidence of corruption and hiding activity. Our findings will not indicate the direction of causation.

Third, a higher rate of extortion by mafia may also induce more unofficial activity. The reasoning is the same as for bribes, except in this case the mafia collects the extortion payments. While the mafia may also extract payments from hidden activities, hiding may involve concealment both from the authorities and from private criminal groups. Anecdotal evidence indicates that criminals in former communist countries obtain their information via government employees, from tax returns and statistical reporting (Gustafson 1999, Chapter 6). As with

bureaucratic corruption, the causality could be reversed: protection rackets may prey more on firms that hide than on firms that fully report their output to the authorities.

Fourth, there are also costs to underreporting output (Marcouiller and Young, 1995; Friedman, Johnson, Kaufmann, and Zoido-Lobaton, 1999). The amount of output hidden will vary with the opportunity cost of hiding. If its activities are underground, the firm cannot appeal to the courts to enforce its contracts. The cost of operating underground is that the firm might have to deal with a restricted set of trading partners whom for some reason the firm regards as trustworthy, foregoing gains from trade with a broader set of potential trading partners (Johnson, McMillan, and Woodruff, 1999). It may also be difficult to raise equity capital, because outside owners would want to see some verification of what the firm is actually doing. Similarly, it may be harder to borrow from a bank because to do so would require official documentation, especially if the bank requires collateral and if the process of hiding economic activity involves concealing the true ownership of assets. Thus firms are more likely to hide output if the economy has underdeveloped market-supporting institutions.

To summarize: the literature predicts a positive association between hiding and tax rates (though this could be reversed if penalties for tax evasion increase with the amount of unpaid taxes); a positive association between hiding and either bureaucratic corruption or mafia extortion (though the causality could go in either direction); and a negative relation between hiding and the benefits of being in the formal sector. These possible causes of hiding will be examined in the regressions of Section 5. Before going to the regressions, however, we use descriptive statistics to compare the determinants of unofficial activity across the five countries.

4. Cross-Country Evidence

Tables 1 and 2 present the cross-country comparisons of hidden activity and variables representing the four possible causes of hidden activity outlined above. The country level data clearly show clear differences between Russia and Ukraine on the one hand, and Poland, Slovakia and Romania on the other hand. These findings are consistent with those of other researchers. Frye and Shleifer (1997), for example, argue that the Russian government acts like a “grabbing hand,” impeding investment, whereas the Polish government does not. Ukraine, according to our data, also has a grabbing-hand government, whereas Slovakia and Romania are similar to Poland.

Across the five countries, we find evidence supporting all four of the possible causes of hidden activity. Hidden sales are highest in Ukraine and Russia, and so are the measures of taxes, corruption and “other protection” payments. The benefits of keeping activity formal—the availability of loans and the ability to use the legal system—are greater in the three Eastern European countries.

Firms are understandably reluctant to reveal the level of their payments to the government, even when the payments are official. We therefore phrased questions about these payments in terms of payments made by “firms in your sector.” However, managers presumably most often respond based on their own experiences, and with caution we believe the responses can be interpreted as indicating the firms’ own payments.

In general, the response rates to the questions related to the possible causes of hidden

activity were in excess of 90% in Poland, Slovakia and Romania. In Russia and Ukraine, on the other hand, only about a third of the firms responded to these questions. Tables 1 and 2 indicate both the numbers of firms surveyed in each country and also the number of responses for each question.

Taxation

Officially, tax rates in all five countries are quite similar (see the Appendix for more detail). In terms of corporate taxation and social security tax, Russia and Ukraine have, if anything, lower posted rates than the three East European countries. According to our respondents, however, taxes as a percentage of sales are significantly higher in Russia and Ukraine than in the other three countries; they are lowest in Poland.⁹ The Romanian firms also reported significantly more taxation than did the Polish firms. Other payments to the government are also higher in Russia and Ukraine than in other countries.

Given that taxes are levied on corporate income, however, these findings on taxation may just be a consequence of firms being more profitable in Russia, Ukraine, and Romania. Taking the midpoint of categorical responses, profits average 21% of sales in Russia, 18% of sales in Ukraine, and 13% of sales in Romania. In Poland, profits average 10% of sales and in Slovakia 6% of sales. Managers of startups report higher taxes as a percentage of sales than do managers of spin-off firms in all the countries.¹⁰ This likely also reflects the greater profitability of startups.

⁹ To make it easier to obtain comparable information, we asked managers to report taxes and other payments as a percent of total sales. However, it is possible that these numbers are only a percent of officially reported sales. This would imply a lower effective tax burden in Russia and Ukraine, although it would confirm the stronger incentive in those countries for firms not to report all their activities.

¹⁰ The difference between startups and spinoffs is significant only for Romania (t-statistic of 2.9) and Ukraine (t-statistic of 2.4).

Corruption

Thicker webs of regulation lend themselves to greater extraction of bribes by bureaucrats. We asked the respondent to estimate the fraction of his or her time devoted to various activities. The averaged responses to time spent on “matters related to all levels of government/regulatory activity (including taxes, licenses, labor, and trade regulations),” shown in Table 2, provide a measure of the regulatory burden in each of the countries. Managers in Russia and Ukraine say they spend, respectively, a fifth and a quarter of their time dealing with the government, much more than their counterparts in the other three countries. Managers of startups spend more time dealing with the government than do managers of spin-off firms in Russia, Ukraine and Slovakia. This question also has the virtue of being less intrusive, and hence the response rates are much higher than for our more direct measures of corruption. Even in Russia and Ukraine, almost 75% of the managers responded to this question.

Table 2 also shows answers to a series of questions intended to measure the incidence of bribes more directly. As with the other questions, these were phrased in terms of “typical firms in the industry.” Managers were asked whether firms typically make “direct or indirect payments to government officials to obtain permissions and licenses,” and whether firms must make “unofficial or extralegal payments” for government services. The data clearly show that bribes are much more extensive in Russia and Ukraine than in Eastern Europe. About 90% of firms Russian and Ukrainian respondents say firms make extralegal payments for licenses and

services.¹¹ Among the three remaining countries, the percentage reporting such payments is higher in Slovakia (40%) than in Poland (20%) and Romania (20%; see Table 2). Note, however, that given the nature of our data we cannot determine whether firms hide output in order to pay less bribes or whether firms that hide more output have to pay more bribes.

Mafia Protection

Almost all (90%) of the managers in Russia and Ukraine said firms in their industry make “a payment for the ‘protection’ of their activities” (Table 2).¹² In contrast, only 15% of Slovakian managers, and even lower levels of Polish (8%) and Romanian (1%) managers, said such payments were common. We use the response to this question to indicate payments to mafia or other private protection rackets.

Benefits from Being in the Formal Sector

We have three measures for the benefits of being in the formal sector. First, we asked managers whether they could rely on courts to enforce contracts with trading partners. The lowest percentage of positive responses came from managers in Russia and Ukraine, where slightly more than half expressed confidence in courts. Two-thirds of managers in Slovakia said

¹¹ A 1996 survey of managers of Russian small and medium enterprises found similarly widespread corruption: 90% reported being subject to “extortion by government officials” (compared with our 91% making extralegal payments) (OECD 1997, p.137).

¹² These numbers are plausible, although somewhat are higher than commonly believed. In a 1996 survey of the Russian managers of small and medium enterprises (OECD 1997, p.137), 83% said they were subject to “extortion based on threats of violence” (compared with our 93% saying payments for protection are made). In the 1996 survey of Russian shopkeepers by Frye and Shleifer (1997), 76% said one cannot operate a store without paying private security agencies and 39% said they had been contacted by the mafia in the previous six months; among Polish shopkeepers the corresponding numbers were 8% and 6% (compared with our 8% of Polish managers saying protection payments are made). A referee points out that these numbers may be consistent with our estimates, given that our information comes only from firms that are at least partly registered. This would require that completely unregistered firms pay less to the mafia.

that courts were effective, the lowest level of any of the three Eastern European countries. A lack of faith in the courts may create an incentive to be unofficial.

Being formal might make it easier to obtain credit. Firms in Poland were significantly more likely to have received a loan from a bank in 1996. Almost half (49%) of firms in Poland said they had a loan, compared to a quarter of the firms in Slovakia and Romania and about 15% of the firms in Russian and Ukraine. However, the Russian and Ukrainian firms, both spin-offs and startups, were much more likely to have had access to credit when they started the firm. Access to credit does not appear to be a major consideration in the decision to hide activity.

Remaining formal may also allow firms to have access to outside equity finance. Coordinating multiple sets of books, which is an essential part of hiding activity, is likely to be much more difficult once partners from outside the immediate family are added. We asked managers who owned the firms. Again it is noteworthy that Russian and Ukrainian firms were hesitant to provide ownership information. A fifth or less of firms in these two countries responded to this question, while the response rate in the other three countries was near 100%. Among firms responding, the percentage of firms with some outside ownership is highest in Ukraine (87%) and Russia (83%), and lowest in Romania (41%).

Correlations with Hidden Sales

To simplify the presentation, we combine the countries into the two groups indicated by the data in Tables 1 and 2. The correlations for Poland, Slovakia and Romania are shown in Table 3 and those for Russia and Ukraine in Table 4. In both regions, there is a strong positive

correlation between hidden sales and hidden salaries.

In Poland, Slovakia, and Romania, hidden activity is positively correlated with making extralegal payments for services and making indirect payments for licenses. More profitable firms hide more of their activity. Hiding is negatively correlated with having owners outside the manager's immediate family. There are no significant correlations between the level of hidden activity and any of the other variables shown on Table 3.

Looking at correlations among the measures of causes of hidden activity in Eastern Europe, we find evidence that firms that make large illegal payments to one set of government officials do not reduce their tax burden, but do become involved in other illegal payments. Making extralegal payments for services and indirect payments for licenses are positively correlated with the level of taxes as a percent of sales and with making "protection" payments.

The correlations between hidden activity and the measures of its causes are distinctly different in Russia and Ukraine (see Table 4). There is a negative correlation between hidden activity and making extralegal or indirect payments for services and licenses, and a positive correlation between hidden activity and both the profitability of a firm and its manager's confidence in the legal system. In contrast to Eastern Europe, taxes and "other payments" to the government are positively correlated in Russia and Ukraine. They are also negatively correlated with the extent of hidden activity. The correlations shown in Table 4 should be interpreted with some caution, however, because there is little variation in many of the measures. For example, only six of the 150 managers responding say firms do not make extralegal payments for services. These six managers say firms hide between 85% and 98% of their activity.¹³

¹³ Many of the other correlations hold for privatized firms but not for startups. For example, there is no significant correlation between hidden sales and confidence in courts among startups (a p-value of .88) or hidden sales and having a loan in 1996 (a p-value of .72).

Across both the Eastern Europe and the former Soviet Union countries the correlations offer support for all four possible causes of hidden activity. Within the group of three Eastern European countries, where the variance in the data is greater than in the former Soviet Union countries, we find that the measures of corruption correlate most strongly with the level of hidden activity. We next turn to firm level regressions in which we can control for other firm characteristics.

5. Firm Level Regressions for Eastern Europe

Table 5 reports the basic results from regressions with the percent of hidden sales on the left-hand side. The regression sample is limited to firms in Poland, Romania, and Slovakia. While the Russian and Ukrainian firms in our sample answered many of the questions about unofficial activity, five out of six of them refused to answer one or more important question. For those firms on which we do have enough data, there is too little variance in some of the key variables for regressions to be meaningful. For example, only 2 of 105 firms for which there are complete data say that firms do not make extralegal payments for services; only 4 say firms don't make payments for protection. As a result, the regressions provide little information beyond that provided by the correlations reported in Table 4. The regression results for these countries are available from the authors.¹⁴

Because almost two-thirds of the firms in our East European sample report that no sales are hidden, the reported regressions are tobits with left-handed censoring at zero. On average the surveyed firms included in these regressions said 6.8% of sales are hidden; the average for firms

¹⁴ Limiting the sample to Eastern Europe reduces the variance in the independent variables, making it harder to find positive results of key variables such as corruption.

with a non-zero response was 17.9%.

The first column of Table 5 reports results from a benchmark regression that includes only industry dummies and country dummies for Slovakia and Romania. The sample includes the 590 observations for which the complete set of data is available. The coefficients shown in all of the tobits are the marginal effect of a change in the independent variable in the uncensored range.¹⁵ Standard errors are in parentheses. All of the regressions in Table 5 include a set of 9 industry dummies. Both Slovakia and Romania have more hidden activity than Poland, although the result for Romania is not significant. Conditional on hiding some activity, a firm in Slovakia hides almost 3% more and a firm in Romania hides just over 1% more than a firm in Poland.

Columns two through five of Table 5 add variables representing each of the four possible causes of hidden activity — tax, corruption, mafia, and the measures of benefits of being in the formal sector, respectively. We find no significant effects of the mafia or the benefits of being in the formal sector.¹⁶ The insignificance of the variable representing the mafia may reflect the fact that only 6% of the regression sample say payments for protection are common. Taxation as a percentage of sales is not associated with hidden activity, but there is a positive association between profit rates and hidden sales ($t=2.3$). However, the variables representing corruption are significant. Managers saying that firms make extralegal payments for services report that hidden sales are 2.5 percentage points higher ($t=2.1$), and saying that firms makes indirect payments for licenses is associated with almost 4 percentage points more hidden sales ($t=3.3$).¹⁷ None of these

¹⁵ We multiply the tobit coefficient by the percent uncensored to obtain the marginal effect conditional on the firm having a nonzero response.

¹⁶The sample for all of the regressions is limited to the observations for which all the variables have valid responses. The samples for the regressions reported in columns 2-5 are each potentially larger. Using the largest available sample has no effect on the results with one exception — the measure of outside ownership is significant in Column 5 when the larger sample is used ($t=2.3$).

¹⁷ We emphasize that this does not establish if firms hide more output in order to avoid bribes or if firms that hide more have to pay higher bribes. Our results show a correlation and nothing about causation.

results are altered when all of the variables are included together (column 6), or when a set of controls for firm and managers characteristics is added (column 7).

Column 8 of Table 5 reports the marginal coefficients from a probit regression in which the dependent variable is one if the firm says that some sales are hidden. This allows us to see if there is a discontinuity at zero. We might expect, for example, that having owners outside the manager's family makes hiding any level of sales more problematic. However, we find no changes in the significance levels of the 4 sets of explanatory variables. The probit regression shows that making extralegal payments for services increases the probability that some sales are hidden by 11%, while making extra legal payments for licenses raises the probability that some sales are hidden by 23%. Firms reporting profits of 20% of sales are 3.5% more likely to hide some sales than firms with a profit rate of 10% of sales.

The last column reports a Tobit regression using percent of hidden salaries as an alternative dependent variable. The specification is the same as that used in column 7. The two corruption variables and the profit variable remain significant at the .10 level or greater, and the variables measuring tax, mafia and benefits of the formal sector all remain insignificant.¹⁸

The last three columns of Table 5 include three controls for firm characteristics. First, we include a dummy equal to one if the firm is a startup; this variable is not significant. Managers of older firms do report significantly higher levels of hidden sales. The effect is not large: in the column 7 specification, for example, a movement of one standard deviation from the mean changes the level of hidden sales by only 1%. Finally, the log of employment at the time of interview is not significant.

¹⁸ The sample is slightly smaller in the last column, because a few firms responding to the hidden sales question did not respond to the hidden salaries question.

These regressions also include four human-capital controls: the education level and age of the manager, and indicators of previous work experience in the private sector and as a senior manager at a state-owned enterprise. None of these variables is significant in the hidden-sales equation. Managers with private-sector experience say about 3% less of salaries are hidden ($t = 1.93$). Managers with more education also report higher levels of hidden salaries ($t = 1.72$).

Discussion of Results

In summary, the firm-level regressions offer no indication that taxes, mafia payments, or the benefits of being in the formal sector are significantly associated with the amount that firms hide. However, at the firm level, paying bribes is positively associated with hiding economic activity. The regression analysis therefore sharpens our findings from cross-country averages and simple correlations. Either firms hide their activities in order to reduce the bribes they need to pay, or they pay bribes in order to be able to hide their activities. The effects of bureaucratic corruption show clearly in the regressions despite the fact that, for reasons of missing data, our regressions covered only the three East European countries and omitted Ukraine and Russia where, as described in the previous section, bureaucratic corruption is much more prevalent.

We find no association between hiding output and our proxies for the opportunity cost of hiding. This might be because our regressions presume there is a marginal effect: if the firm hides a little more output, it gets a little less value out of access to the courts, to loans, or to outside finance. Perhaps, however, these are not marginal effects. A firm that already has access to the courts might not lose this access by hiding a little more of its output, for example. All of

our firms are registered. Perhaps the major difference in the effects of access to the courts is between registered and unregistered firms, rather than between registered firms that hide varying amounts of their output.

6. Conclusion

We have found that many registered firms sell much of their output and hire much of their labor through unofficial channels. This hiding of activity is arguably an impediment to private-sector development in the post-communist economies. The results from our survey confirm the pattern suggested by previous estimates of the size of the unofficial economy.¹⁹ The unofficial economy is significant in Eastern Europe, but is much larger in Russia and Ukraine. Our data allow us to test alternative explanations for the differences across countries and across firms.

Aggregated at the country level, our data are consistent with all four of the possible explanations for hidden activity. Hidden activity is larger in countries where tax rates are higher, where managers are more likely to pay bribes, where managers pay for mafia-type protection, and where managers have less faith in the legal system.

Our regressions using firm-level data from Poland, Slovakia and Romania find no significant association between tax rates and the extent of unofficial activity in Eastern Europe. If there is a tax rate effect, it probably lies more with the way the tax system is operated.

We find only weak evidence that the ability of the legal system to enforce contracts affects entrepreneurs' decisions on whether or not to hide their activity. Ability to access bank

¹⁹ Our results also confirm the finding of Johnson, Kaufmann, and Shleifer (1997) that official GDP may be significantly underestimated, particularly in Russia and Ukraine.

loans and to involve outside owners also do not appear to be significant. This is probably because the firms in our sample maintain at least some official activity, and the decision they make is, at the margin, how much to report officially, so most of the firms in our sample can have access to government-provided public services if they want.

We find no evidence that payments to private criminal groups affect the decision to hide activities. This may be because we surveyed manufacturing firms that are relatively immune from mafia-run protection rackets.²⁰ Most likely, however, it indicates that organized crime is not a large problem in Eastern Europe (in contrast to Russia and Ukraine).

We find a significant association between corruption, in the form of bribes paid to government officials, and the hiding of output. This is clearly far worse in Russia and Ukraine than in Eastern Europe. Even within Eastern Europe, firms that say bureaucrats are corrupt are more likely to hide activity. However, we cannot distinguish whether firms hide more to avoid corruption or whether firms that hide more have to make illegal payments; we leave this for further research.

²⁰ The previous empirical work on this issue in Russia has focussed on retail stores (Zhuravskaya and Frye 1998). These are vulnerable in part because they cannot move without losing a great deal of the business's value. Manufacturing companies can also choose to be located inside other firms (e.g., it is very common in Russia for a small new firm to operate on the premises of a much larger privatized firm that provides security.)

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Appendix: Tax Rates and Legal Environment

Tax Rates

Four organizations provide information on tax rates in our sample countries during 1997-98. Tax rates are high in all five countries, but taxes paid by firms (i.e., corporate and social security tax rates) in Russia and Ukraine are generally not higher, and in some instances may be lower, than in Poland, Slovakia, and Romania. The picture for personal tax rates is mixed, with Ukraine and Romania having the highest tax rates, followed by Slovakia and Russia, and then Poland. Overall, however, we can conclude that the posted tax rates that firms are supposed to pay are, if anything, higher in the East European countries of our sample than in Russia and Ukraine.

The Heritage Foundation's 1998 Index of Economic Freedom (Johnson, Holmes and Kirkpatrick 1998) provides the most comprehensive evaluation.²¹ For corporate taxes, the most relevant category for firms in our sample, these authors consider taxation to be better (i.e., lower) in Russia and Ukraine than in the three East European countries in our sample. Russia receives a score of 3, indicating moderate corporate taxation (the scale is from 1 to 5, with 5 representing the worst or highest taxation.) They say, "The top corporate income tax rate (including both federal and regional taxes) is 35 percent" (p.293).²² Ukraine also receives a corporate taxation score of 3. Its top corporate tax rate is reported as being 30 percent. In contrast, Poland,

²¹ The Heritage Foundation Indices are published early in the year (e.g., the 1999 Index was available right at the beginning of 1999) and cover the previous year (i.e., the 1999 Index really evaluates the situation in 1998.)

²² The Heritage Foundation's tax ratings focus primarily on posted tax rates, rather than the way the tax system is administered or whether tax inspectors are corrupt. A rating of 3 is considered "moderate taxes" and indicates "a progressive corporate tax system with a top rate of between 26 percent and 35 percent, or a flat tax system with tax levels above 25 percent" while a rating of 4 is called "high taxes" and represents "a progressive corporate tax system with a top rate of between 36 percent and 45 percent, and a tax structure not fully developed by the government or in a state of disarray" (Johnson, Holmes, and Kirkpatrick 1998, p.41). The same criteria were used in the 1997 and 1999 Indexes (Johnson, Holmes and Kirkpatrick 1997, p.37, Johnson, Holmes and Kirkpatrick 1997, p.58.)

Slovakia and Romania all have a corporate taxation score of 4. The top corporate income tax rate is reported to be 38 percent in Poland, 40 percent in Slovakia and 38 percent in Romania.²³

In its assessment of personal income tax rates, the Heritage Foundation 1998 Index is still relatively favorable to Russia, awarding a score of 3. The authors say the “top income tax rate is 35%, up from 30% last year and the average income level is taxed at 12 percent” (Johnson, Holmes and Kirkpatrick 1998.)²⁴ Ukraine receives a score of 4+, with the comments that the “top income tax rate is 40%”, and average income is approximately taxed at “20%, down from 30% last year.” The worst rating on this dimension goes to Romania, which is rated as 5, indicating very high tax rates, with the comment that the “top income tax rate is 60%, and the average income is taxed at 28%.” Income taxation in Slovakia is rated as 4: the “top marginal income tax rate is 42%, with the average taxpayer subject to a rate of about 20 percent.” Finally, Poland is considered to have low income taxation. It receives a score of 2, while the authors add that the “top income tax is 45%; the average income level is taxed at a rate of 0 percent.”²⁵

The IMD’s World Competitiveness Yearbook (1998) offers independent confirmation of these numbers. For the countries in our sample, this source unfortunately provides information only on Poland and Russia. IMD (1998) confirms that posted tax rates in Russia are not higher

²³ The Heritage Foundation’s Index covering 1998-99 gives unchanged ratings on corporate taxation in all five countries: Russia and Ukraine are at 3, and Poland, Slovakia, Romania are at 4 (Johnson, Holmes and Kirkpatrick 1999). The earlier Index for 1996-97 gives Russia and Ukraine a score 3+ (i.e., slightly higher taxation than in 1998 or 1999), while Poland, Slovakia, and Romania were rated as 4 (Johnson, Holmes and Kirkpatrick 1997).

²⁴ A score of 2 indicates “low taxes,” meaning “a top tax rate of 25 percent or below, or a flat income tax between 10 percent and 20 percent, or a top rate of 40 percent or below and a tax on average income below 10 percent.” A score of 3 indicates “moderate taxes,” meaning “a top tax rate of 35 percent or below, or a tax on average income below 15 percent.” A score of 4 indicates “high taxes,” meaning “a top income tax rate of 36 percent to 50 percent, or an average tax level between 15 percent and 20 percent, and a tax structure not fully developed by the government or in a state of disarray.” A score of 5 indicates, “a top rate above 50 percent and a tax on average income between 20 percent and 25 percent, or a tax rate on average income of 25 percent or above regardless of the top rate, or a tax system through which the government confiscates most economic output resulting from government ownership of most economic activity” (Johnson, Holmes and Kirkpatrick 1998, p.40). The criteria behind this taxation rating have remained consistent over time (Johnson, Holmes and Kirkpatrick 1997 and 1999.)

²⁵ In the 1997 Heritage Foundation Index the ratings for income taxation were 3 for Russia, 5 for Ukraine, 5 for Romania, 4 for Slovakia, and 2 for Poland (Johnson, Holmes and Kirkpatrick 1997). The only rating that was

than in Poland. They report the average corporate tax rate on profit in 1997 was 35 percent in Russia and 38 percent in Poland. The employer's social security contribution in 1997, as a percent of GDP per capita, was 0.01 percent in Russia and 48.2 percent in Poland. The effective personal income tax rate, as a percent of GDP per capita, was 11.42 percent in Russia and 20.14 percent in Poland.

The European Bank for Reconstruction and Development, EBRD (1997), provides additional detailed relevant information, including an assessment of the "social security tax" rate paid by employers (usually as a percent of wages), but unfortunately does not provide a consistent assessment across countries. On Russia, EBRD (1997) provides the least information but does comment that: "The tax system as a whole remains unstable, non-transparent and highly onerous for enterprises" (p.197).²⁶ For Ukraine, the EBRD (1997) reports that in June 1997 a new corporate tax law introduced a 30% base rate and a switch from revenue to profit taxation. Employers pay 37% of the wage bill for the social and pension funds and 12% for the Chernobyl and employment funds. For Romania, the EBRD (1997) reports a single corporate profit tax rate of 38% that "applies to all permanently established legal entities" (p.194). In addition, employer contributions to the Social Security Fund are levied at 24% of wages, the personal income tax has a maximum rate of 60%, and the value-added tax is at a rate of 18 percent. For Slovakia, EBRD (1997) reports that the corporate tax rate was reduced in 1994 to 40% and maximum personal income tax was reduced to 42%. "Employers and employees contribute 38% and 12% respectively of the employees gross income for pension, unemployment and health contributions." For Poland, the November 1996 Corporate Income Tax Law reduced the

different in the 1999 Index was a reduction in Ukraine's rating to 4 (Johnson, Holmes and Kirkpatrick 1999).

²⁶ In the section "Transition Indicators," the EBRD (1996) also does not provide detailed information about tax rates in Russia. The EBRD (p. 56, 1995) reports that the enterprise profit tax was 35 percent, the personal income tax rate was between 12 and 30 percent, and the "payroll tax" rate was 40 percent of the wage bill.

corporate tax rate to 38% in 1997 “and provided for further cuts of 2 percentage points in each of the next three years until a 32% rate is reached in the year 2000” (EBRD 1997.) In the 1997 budget, the three personal income tax levels were set at 20%, 32% and 40%.²⁷ The payroll tax is not reported in EBRD (1997), but EBRD (1996) says it was raised to 45% in 1992 and that there was also an additional payroll tax of 3% for the Labour Fund (p.166).

Finally, Price Waterhouse (1997a and 1997b) provides comparable tax rate information for Poland, the Slovak Republic and Russia in 1997. It reports income tax rates as 21% in Poland, 20% in the Slovak Republic, and 20% in Russia. Corporate tax rates are given as 40% in Poland, 40% in the Slovak Republic and 43% in Russia.

Legal Environment

Three organizations offer measures of these five countries’ legal environments for business. The picture from these measures of legal and regulatory environment is therefore fairly consistent. Poland is usually the best, followed closely by Slovakia. Ukraine consistently scores the lowest. Russia and Romania occupy intermediate positions, with Romania having a slight advantage in terms of corruption and rule of law.²⁸

The EBRD’s (1997, p.17) measure of the legal system’s “effectiveness” attempts to capture how commercial laws are being “enforced and administered.” The data is obtained from a survey of lawyers in the region and the scale runs from 1 (least effective) to 4+ (most

²⁷ Personal income tax rates had been raised to 21%, 33%, and 45% in 1994 (EBRD 1996, p.166).

²⁸ The more detailed analysis in Johnson, Kaufmann and Shleifer (1997) shows basically the same relative rankings across all the available measures of legal reform. The largest difference is consistently between Eastern Europe and the former Soviet Union (excluding the Baltics).

effective). According to this index there was significant difference between the countries:

Poland scored 4+, Slovakia, Romania and Russia scored 3, and Ukraine scored 2.²⁹

The Wall Street Journal's panel of investment professionals rates the countries according to "their attractiveness as a place to do business over the coming year" on a scale of 1 to 10, with 10 being the best (*Central European Economic Review* 1998).³⁰ At the end of 1997, their overall ratings placed Poland in the lead with a score of 7.8, followed by Russia at 6.0, Slovakia at 5.8, Romania at 5.7, and Ukraine at 3.9. Two sub-indices particularly address the legal environment -- "rule of law" and "corruption". On the rule of law measure, Poland scored 9.0, Romania scored 6.4, Slovakia scored 6.2, Russia scored 5.4, and Ukraine scored 3.9. In terms of corruption, Poland scored 8.2, Slovakia scored 5.7, Romania scored 5.4, Russia scored 3.7, and Ukraine scored 2.1.

The Heritage Foundation's 1998 Index of Economic Freedom also provides information on the legal environment (Johnson, Holmes and Kirkpatrick 1998). A lower score on this measure means "more free," or a more favorable environment for private business.³¹ The 1998 index basically measures the environment in 1997. In the overall index, Slovakia did best with a score of 3.05, Poland scored 3.15, Romania scored 3.3, Russia scored 3.45, and Ukraine was last again with 3.8. In terms of property rights, Poland was ahead with a score of 2, Slovakia and

²⁹ The EBRD's explanations for these scores are rather long and should be consulted by the reader (EBRD 1997, p.19). In summary: 4+ denotes clear commercial laws that are supported by an effective court system; 3 indicates that the commercial laws are clear but not fully supported by the court system; and 2 denotes "commercial legal rules are generally unclear and sometimes contradictory."

³⁰ See the discussion in Johnson, Kaufmann and Shleifer (1997) for details of how this panel operates and its results in previous years. It appears to give consistent and reasonable results over time.

³¹ The overall index is a simple average of a country's scores on 10 dimensions: trade, taxation, government intervention, monetary policy, foreign investment, banking, wages and prices, property rights, regulation, and the black market. See Johnson, Holmes and Kirkpatrick (1998) pp.35-51 for a detailed description of each measure.

Russia scored 3, Romania, and Ukraine scored 4.³² Finally, in terms of regulation, Poland and Slovakia scored 3, while Russia, Romania and Ukraine all scored 4.³³

³² This index measures the protection of private property by the government and judicial system. A 2 denotes “very high” protection, a 3 denotes “high” protection, a 4 denotes low protection, and a 5 denotes very low protection (Johnson, Holmes and Kirkpatrick 1998, p.47).

³³ This index measures “how easy or difficult it is to open and operate a business” (Johnson, Holmes and Kirkpatrick 1998, pp.49). A 3 denotes a “moderate” level of regulation and a 4 denotes a “high” level of regulation.

Table 1

	Poland	Slovakia	Romania	Russia	Ukraine
Total Firms in Sample	303	308	321	269	270
Hidden Activity					
Percentage of sales not reported for all firms	5.4%	7.4%	5.7%	28.9%	41.2%
... for Privatized Firms	3.8%	6.2%	3.9%	36.2%	45.7%
... for Start-ups	5.9%	7.7%	5.9%	18.7%	31.7%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(1.57)	(0.79)	(9.26)	(18.10)
Number of observations	259	200	204	132	150
Percentage of salaries not reported	8.6%	7.6%	7.6%	26.1%	37.9%
... for Privatized Firms	6.2%	5.5%	4.5%	35.8%	41.8%
... for Start-ups	9.3%	8.1%	8.0%	12.8%	29.7%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(0.45)	(0.50)	(5.54)	(13.10)
Number of observations	257	200	199	116	148

The reported T-statistic is from the test that a particular country's mean differs from Poland's mean

Table 2, part 1

	Poland 303	Slovakia 308	Romania 321	Russia 269	Ukraine 270
Total Firms in Sample					
Taxation					
Taxes as a % of sales	15.5%	16.4%	17.2%	23.9%	24.2%
... for Privatized Firms	14.5%	15.8%	12.9%	23.0%	22.8%
... for Start-Ups	15.8%	16.6%	17.8%	25.0%	27.6%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(1.03)	(2.01)	(11.00)	(12.30)
Number of observations	277	278	321	119	135
<i>Other payments to government as percent of sales</i>					
Other payments to government as percent of sales	3.9%	3.8%	4.8%	6.0%	7.2%
... for Privatized Firms	4.3%	2.3%	6.0%	6.2%	7.1%
... for Start-Ups	3.8%	4.3%	4.6%	5.8%	7.3%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(0.12)	(1.90)	(6.40)	(7.80)
Number of observations	277	278	321	74	65
Profits in 1996 as a % of sales					
Profits in 1996 as a % of sales	10%	6%	13%	21%	18%
... for Privatized Firms	8%	5%	10%	20%	18%
... for Start-Ups	11%	6%	13%	21%	19%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(5.80)	(4.20)	(14.00)	(9.60)
Number of observations	293	292	320	245	229
Regulation and Corruption					
<i>Percent of managers time spent on government/regulatory matters</i>					
Percent of managers time spent on government/regulatory matters	10.3%	11.8%	8.0%	18.3%	25.4%
... for Privatized Firms	12.9%	11.3%	10.9%	18.4%	24.7%
... for Start-ups	9.5%	12.0%	7.6%	18.5%	27.3%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(1.46)	(2.60)	(7.42)	(14.00)
Number of observations	302	306	320	201	199
<i>Percent who think firms make extralegal payments for government services</i>					
Percent who think firms make extralegal payments for government services	20.0%	38.0%	20.0%	91.0%	87.0%
... for Privatized Firms	16.7%	30.4%	15.0%	93.3%	86.8%
... for Start-Ups	21.1%	40.5%	20.7%	88.0%	90.0%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(5.00)	(0.04)	(17.3)	(13.9)
Number of observations	298	306	315	122	84
<i>Percent of firms saying that firms make unofficial payments for licences</i>					
Percent of firms saying that firms make unofficial payments for licences	19.3%	42.2%	17.0%	91.7%	87.5%
... for Privatized firms	18.2%	30.4%	12.5%	93.8%	87.7%
... for Start-Ups	19.7%	45.7%	17.7%	88.5%	90.0%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>		(6.30)	(0.74)	(18.30)	(14.70)
Number of Observations	300	303	317	120	88

Table 2, part 2

	Poland	Slovakia	Romania	Russia	Ukraine
Mafia Protection					
<i>Percent of firms saying that firms pay for "protection"</i>					
	8.0%	14.9%	0.6%	92.9%	88.8%
... for Privatized firms	9.1%	10.0%	0.0%	94.0%	88.6%
... for Start-Ups	7.6%	16.4%	0.7%	90.9%	91.7%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>					
		(2.70)	(4.63)	(29.90)	(25.30)
Number of Observations	302	308	320	126	107
 Benefits from Being in the Formal Sector					
<i>Percent saying courts can be used to enforce an agreement</i>					
	72.9%	67.9%	86.9%	58.4%	54.7%
... for Privatized Firms	72.7%	75.7%	80.0%	62.9%	62.1%
... for Start-Ups	73.0%	65.6%	87.9%	53.4%	36.6%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>					
		(1.37)	(4.43)	(4.36)	(4.64)
Number of observations	303	308	321	269	269
<i>Percent of firms with outside ownership</i>					
	57%	45%	41%	83%	87%
... for Privatized Firms	89%	65%	95%	100%	97%
... for Start-Ups	48%	39%	34%	71%	77%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>					
		(2.95)	(4.00)	(3.10)	(4.30)
Number of observations	301	305	321	36	55
<i>Received credit 1996</i>					
	48.8%	27.6%	24.1%	17.0%	13.8%
... for Privatized firms	42.2%	44.3%	47.5%	21.5%	14.7%
... for Start-Ups	50.6%	22.7%	20.8%	12.0%	11.1%
<i>T-statistic for difference in means for all firms (using Poland as base case)</i>					
		(5.53)	(6.62)	(8.20)	(9.12)
Number of Observations	303	308	319	236	232

The reported T-statistic is from the test that a particular country's mean differs from Poland's mean

Table 3

	Poland, Slovakia and Romania										
	% of Sales Hidden	% of Wages Hidden	Taxes as a % of sales	payments to government	on regulatory matters	Extra-Legal Payments	Extra payments for licences	Payments for Protection	Courts can enforce contracts	Outside ownership	Bank loan in 1996
% of sales hidden											
% of wages hidden	0.68 (642, <.01)										
Taxes as a % of sales	0.02 (623, .55)	0.04 (618, .36)									
Other payments to government, % of sales	-0.02 (623, .55)	-0.004 (618, .93)	-0.21 (876, .01)								
% of manager's time on regulatory matters	-0.03 (660, .41)	0.03 (653, .41)	-0.01 (872, .81)	0.03 (872, .45)							
Firms make extra-legal payments for services	0.16 (656, <.01)	0.13 (648, <.01)	0.08 (864, .03)	0.02 (864, .64)	-0.04 (915, .19)						
Firms make extra-legal payments for licenses	0.16 (658, <.01)	0.18 (651, <.01)	0.06 (865, .07)	0.03 (865, .43)	0.03 (916, .41)	0.5 (910, <.01)					
Firms make payments for protection	-0.01 (663, .78)	-0.05 (656, .25)	-0.01 (875, .76)	0.06 (875, .07)	0.002 (926, .94)	0.16 (918, <.01)	0.17 (920, <.01)				
Courts can enforce contracts	-0.01 (663, .75)	0.03 (656, .41)	0.03 (876, .37)	-0.03 (876, .34)	-0.06 (928, .05)	-0.002 (919, .96)	-0.02 (920, .50)	-0.11 (930, <.01)			
Firm has outside ownership	-0.07 (659, .08)	-0.07 (651, .06)	-0.05 (871, .13)	-0.02 (871, .66)	0.002 (923, .96)	-0.03 (914, .31)	-0.05 (915, .16)	-0.02 (925, .65)	0.03 (927, .41)		
Firm had bank loan in 1996	0.02 (661, .60)	-0.02 (654, .60)	-0.07 (874, .03)	-0.05 (874, .14)	0.001 (926, .99)	-0.09 (917, <.01)	-0.01 (918, .67)	-0.01 (928, .80)	0.02 (930, .48)	0.13 (925, <.01)	
Profits in 1996	0.04 (649,0.28)	0.1 (642, 0.01)	0.04 (855, 0.2)	0.03 (855, 0.4)	-0.05 (901, 0.14)	-0.02 (892, 0.57)	-0.05 (893,0.12)	-0.1 (903,<.01)	0.02 (905,0.55)	-0.1 (902,<.01)	-0.1 (903,<.01)

The number of observations and significance level are in parentheses.

Table 4

	% of Sales Hidden	% of Wages Hidden	Taxes as a % of sales	payments to government	on regulatory matters	Russia and Ukraine Extra-Legal Payments	Ukraine Extra payments for licences	Payments for Protection	Courts can enforce contracts	Outside ownership	Bank loan in 1996
% sales hidden											
% wages hidden	0.92 (257, <.01)										
Taxes as a % of sales	-0.65 (220, <.01)	-0.68 (205, <.01)									
Other payments to government, % of sales	-0.29 (220, <.01)	-0.25 (205, <.01)	0.19 (254, <.01)								
% of manager's time on regulatory matters	-0.38 (252 <.01)	-0.36 (236, <.01)	0.37 (234, <.01)	0.23 (234, <.01)							
Firms make extra-legal payments for services	-0.38 (150, <.01)	-0.35 (136, <.01)	0.25 (132, <.01)	0.25 (132, <.01)	0.27 (172, <.01)						
Firms make extra-legal payments for licenses	-0.37 (160, <.01)	-0.34 (146, .01)	0.25 (142, <.01)	0.25 (142, <.01)	0.27 (180, <.01)	NA					
Firms make payments for protection	-0.37 (186, <.01)	-0.33 (172, <.01)	0.2 (167, .01)	0.21 (167, <.01)	0.28 (206, <.01)	0.95 (191, <.01)	0.95 (202, <.01)				
Courts can enforce contracts	0.17 (275, <.01)	0.17 (257, <.01)	-0.29 (254, <.01)	-0.08 (254, .22)	-0.16 (400, <.01)	-0.05 (198, .48)	-0.04 (208, .52)	-0.03 (233, .68)			
Firm has outside ownership	NA	NA	0.24 (56, .07)	0.24 (56, .08)	0.07 (76, .56)	-0.06 (30, .75)	-0.06 (30, .75)	-0.04 (41, .78)	0.05 (91, .61)		
Firm had bank loan in 1996	0.43 (260, <.01)	0.43 (243, <.01)	-0.37 (241, <.01)	-0.21 (241, <.01)	-0.19 (371, <.01)	-0.11 (183, .15)	-0.09 (192, .19)	-0.08 (218, .23)	0.07 (468, .16)	-0.02 (81, .85)	
Profits in 1996	0.21 (272, <.01)	0.17 (254, <.01)	-0.12 (249, .05)	-0.27 (249, <.01)	-0.09 (379, .09)	-0.01 (190, .85)	-0.01 (200, .87)	0.04 (225, .57)	0.004 (474, .93)	0.06 (87, .57)	0.09 (432, .06)

The number of observations and significance level are in parentheses.

Table 5
Tobit and Probit Regression Results
(Poland, Slovakia and Romania only)

Dependent variable: Percent of Sales Hidden

	Just Industry and Country Dummies	Tax Variables	Corruption Variables	Mafia Variables	Benefits of Being in Formal Sector	All 4 Sets of Measures Together	With Human Capital and Firm Controls	Firm reports positive level of hidden sales (Probit)	Hidden Salaries as depende nt variable
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Taxation									
Taxes as a percent of sales		2.14 (4.62)				-0.07 (4.62)	-0.30 (4.66)	-0.1 (0.20)	4.49 (5.43)
Corruption Variables									
Firm makes extra-legal payment for services			2.51			2.51	2.55	0.11	2.31
Firm makes extra-legal payment for licence			(1.18)			(1.18)	(1.18)	(0.06)	(1.42)
			3.95			3.84	3.88	0.23	4.58
			(1.20)			(1.22)	(1.22)	(0.06)	(1.42)
Mafia Variable									
Firm pays for protection				-0.17 (2.00)		-1.07 (1.96)	-1.00 (1.96)	-0.07 (0.09)	-1.82 (2.45)
Benefits of Being in the Formal Sector									
Courts can enforce contracts					-0.55 (1.18)	-0.74 (1.18)	-0.44 (1.18)	-0.02 (0.05)	0.76 (1.38)
Firm has owners outside family					-1.33 (1.00)	-1.03 (0.96)	-0.70 (1.07)	-0.06 (0.05)	-0.18 (1.25)
Firm received a bank loan in 1996					0.29 (1.07)	0.52 (1.07)	0.52 (1.07)	0.0002 (0.05)	-1.07 (1.25)
Profits									
Profit in 1996		12.78 (5.58)				10.16 (5.54)	8.39 (5.62)	0.35 (0.2)	12.55 (6.50)
Industry Dummies									
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Slovakia									
	4.03 (1.18)	4.47 (1.22)	2.92 (1.18)	4.03 (1.22)	3.84 (1.22)	3.33 (1.26)	3.77 (1.33)	0.20 (0.06)	-0.27 (1.56)
Romania									
	1.37 (1.18)	0.85 (1.22)	1.33 (1.18)	1.37 (1.22)	1.29 (1.26)	1.00 (1.26)	1.51 (1.44)	0.09 (0.06)	-2.00 (1.65)
Measures of Manager's Human Capital Included?									
Log of firm age	No	No	No	No	No	No	Yes	Yes	Yes
							1.81	0.06	1.51
Log of employment							(0.96)	(0.04)	(1.56)
							-0.67	-0.03	-0.85
Dummy for Start- Up							(0.59)	(0.03)	(0.71)
							0.33	-0.02	0.76
Number of Observations							(1.44)	(0.06)	(1.65)
Chi-Squared	590	590	590	590	590	590	590	590	582
Percent uncensored	32.3	32.7	61.0	32.3	34.3	66.7	72.8	90.6	69.9
	36.9%	36.9%	36.9%	36.9%	36.9%	36.9%	36.9%		44.5%

Reported Coefficients in tobit regressions are marginal effects for nontruncated observations

Standard errors are in parentheses