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Rethinking the Research Paradigms for Analyzing Tax Compliance Behavior

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Abstract

Much recent research has investigated whether values, social norms, and attitudes differ across countries and whether these differences have measurable effects on economic behavior. One area in which such studies are particularly relevant is tax compliance, and a factor that has been suggested as a factor in compliance behavior is tax morale, or the intrinsic motivation to pay taxes. However, all of this work on tax morale has focused on individuals, not on firms. In this paper, we use information from the Business Environment and Enterprise Performance Survey and also from the World Enterprise Survey for a wide range of countries over several years of data to examine a firm's tax morale and the subsequent impact on firm tax compliance. We use these data first to examine a firm's perception of taxes as an obstacle to doing business. Importantly, once we control for the various factors that affect this perception, what is left is a measure that we believe is a measure of the firm's tax morale, as a driver of the firm's view of the appropriateness of cheating on taxes. With this measure of tax morale, we are then able to examine in a second stage estimation how our estimated firm tax morale affects the compliance decisions of the firm. Ultimately, our results allow us to identify factors that allow the government to improve its efforts to increase firm tax compliance.

Keywords: tax evasion, tax morale, behavioral economics
JEL: H260, H730, H26, H32

TAX MORALE AND TAX COMPLIANCE FROM THE FIRM'S PERSPECTIVE

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SUMMARY

Much recent research has investigated whether values, social norms, and attitudes differ across countries and whether these differences have measurable effects on economic behavior. One area in which such studies are particularly relevant is tax compliance, and a factor that has been suggested as a factor in compliance behavior is “tax morale”, or the intrinsic motivation to pay taxes. However, all of this work on tax morale has focused on *individuals*, not on *firms*. In this paper, we use information from the Business Environment and Enterprise Performance Survey and also from the World Enterprise Survey for a wide range of countries over several years of data to examine a firm’s tax morale and the subsequent impact on firm tax compliance. We use these data first to examine a firm’s perception of taxes as an obstacle to doing business. Importantly, once we control for the various factors that affect this perception, what is left is a measure that we believe is a measure of the firm’s tax morale, as a driver of the firm’s view of the appropriateness of cheating on taxes. With this measure of tax morale, we are then able to examine in a second stage estimation how our estimated firm tax morale affects the compliance decisions of the firm. Ultimately, our results allow us to identify factors that allow the government to improve its efforts to increase firm tax compliance.

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I. INTRODUCTION

The wide disconnect between (low) tax enforcement policies and (high) tax compliance behaviors is the subject of an extensive and growing literature. The standard portfolio model of individual compliance first developed by Allingham and Sandmo (1972) implies that rational individuals (especially those whose incomes are not subject to third-party sources of information) should report virtually no income. Although compliance varies significantly across countries (and across taxes) and is often quite low, compliance seldom falls to a level predicted by the standard economic theory of compliance. It seems implausible that government enforcement activities alone can account for these levels of compliance. Indeed, the puzzle of tax compliance behavior may well be why people pay taxes, not why they evade them.¹

In the face of this puzzle, researchers have introduced other factors beyond the financial considerations that influence compliance behavior in the economics-of-crime model. An especially appealing avenue is the “intrinsic motivation” for individuals to pay taxes (Frey, 1994, 1997), or what is sometimes also termed their “tax morale”. If taxpayer values are influenced by cultural norms and values, with different societal institutions acting as constraints and varying between different countries, and if these values affect the inclinations to pay (or not to pay) their taxes via their tax morale, then tax morale may be an important determinant of taxpayer compliance. In fact, there is emerging evidence on the potential importance of tax morale in compliance – and other – behaviors.²

However, to date all of this evidence relates to tax morale of *individuals*. To our knowledge, there is no evidence on tax morale of *firms*.

1. For a somewhat contrary view, see Slemrod (2007) and Kleven et al. (2011).

2. For example, see Bohnet and Frey (1994), Alm, Sanchez, and de Juan (1995), Bosco and Mittone (1997), Alm, McClelland, and Schulze (1999), Feld and Tyran (2002), Ahmed and Braithwaite (2004), and Wahl, Muehlbacher, and Kirchler (2010). See Torgler (2007) for a comprehensive review.

The purpose of this paper is to examine factors that influence the tax morale, and the subsequent compliance behavior, of firms. Traditional economic theory casts the firm as a maximizer of profits, expected profits, or the expected utility of profits, thereby allowing the Allingham and Sandmo (1972) framework for individuals to be applied more-or-less intact to firms. However, considering the limitations of this approach in the individual analysis in tax evasion, it is natural to question the relevance of the standard approach for firms as well. While firms are clearly different from individuals, both are subject to the cultural norms that may affect their intrinsic motivation to pay taxes. Further, because any firm's decisions are necessarily made by individuals who own and manage the firms, some of the same factors that drive individual tax morale seem likely to also filter down to firm actions.

To study tax morale of firms, we rely on two measures of a firm's perception of taxes as an obstacle to doing business, measures that capture much (if admittedly not all) of the relevant information about a firm's tax attitudes. These measures are compiled from a pooled data set of firm-level data from multiple countries over a period of several years, a dataset that combines information from the Business Environment and Enterprise Performance Survey (BEEPS) and also from the World Enterprise Survey (WES). In total, our data span eight years, 34 countries, and over eight thousand firms. We use these data first to examine a firm's perception of taxes as an obstacle to doing business. Importantly, once we control for the various factors that affect this perception, what is left is a measure that we believe is a measure of the firm's tax morale, as a driver of the firm's view of the appropriateness of cheating on taxes. With this measure of tax morale, we are then able to examine in a second stage estimation how tax morale affects the compliance decisions of the firm. Ultimately, our results allow us to identify factors that allow the government to improve its efforts to increase firm tax compliance.

II. THE NOTION OF TAX MORALE

The notion of “tax morale” as an explanatory factor in tax compliance behavior goes back as least as far as the 1960s, as demonstrated in work by the “Cologne school of tax psychology” (Schmölders, 1960; Strümpel, 1969). These researchers emphasized that economic phenomena should be seen from a broader perspective than the traditional neoclassical point of view, and should incorporate insights from social psychology. In particular, they saw tax morale as an essential explanation for tax compliance behavior.

This early work foreshadowed the emerging importance of “behavioral economics” as a tool in understanding individual and group behavior, and it is reflected in a range of related approaches, with roots in the psychology of taxation (Lewis, 1982; Kirchler, 2007). In the specific context of tax compliance, tax morale is most obviously linked to “intrinsic motivation” (Frey, 1994, 1997). It is also connected to “taxpayer ethics” (Song and Yarbrough, 1978), to “social norms” (Alm, McClelland, and Schulze, 1999), to perceptions of “power” and “trust” (Kirchler, Hoeszl, and Wahl, 2008), to “committed” versus “capitulative” versus “creative” compliance (McBarnet, 2004), and to “deference” and “defiance” motives in compliance (Braithwaite, 2009). Relatedly, Bohnet and Frey (1994) and Feld and Frey (2002) argue that tax morale is likely to be affected by the nature of the fiscal exchange between taxpayers and government.³ All of this work has led to the recent suggestion by Alm (2011) that taxpayer compliance can be usefully seen through the lens of a “trust paradigm” (beyond the more traditional “enforcement paradigm” that views the taxpayer from the economics-of-crime perspective as a potential criminal who must be deterred from cheating). This trust paradigm is consistent with the role of morality in the compliance decision.

Still, despite this work, the concept of tax morale has still not received the attention that its

3. See Alm, McClelland, and Schulze (1999), Feld and Tyran (2002), and Wahl, Muehlbacher, and Kirchler (2010) for experimental evidence on the role of voting in tax compliance decisions.

role in compliance would seem to merit. As Feld and Frey (2002) point out:

“...most studies treat 'tax morale' as a black box without discussing or even considering how it might arise or how it might be maintained. It is usually perceived as being part of the meta-preferences of taxpayers and used as the residuum in the analysis capturing unknown influences to tax evasion. The more interesting question then is which factors shape the emergence and maintenance of tax morale.”

Further, the work that has taken place has been directed exclusively at *individual* tax morale. The potential importance of *firm* tax morale has been ignored, perhaps because of the absence of firm-level information that would allow a firm's tax morale to be measured.

Indeed, there is relatively little analysis – theoretical or empirical – of tax evasion of firms, at least in comparison with similar types of analyses of individual tax evasion. To be sure, there are some theoretical studies of firm tax evasion (e.g., Marrelli and Martina, 1988; Crocker and Slemrod, 2005; Chen and Chu, 2005; Goerke and Runkel, 2006), as well as a limited empirical literature (e.g., Rice, 1992; Kamdar, 1997; Joulfaian, 2000; Nur-tegin, 2008). Even so, this firm-based literature is much more limited than the individual-based work.

In this paper we attempt to fill these gaps first by measuring firm tax morale and then by using our measure to determine its impact on firm tax compliance.

III. DATA AND EMPIRICAL METHODOLOGY

We use a pooled data set of firm level data from multiple countries over a multi-year period. This dataset combines information from the Business Environment and Enterprise Performance Survey (BEEPS) and the World Enterprise Survey (WES), with eight years of data covering 79 countries and approximately 57,000 firms. Due to missing values and other data shortcomings, actual sample size is approximately 8,500 with firms from 34 separate countries.⁴ All summary

4. The countries are: Albania, Armenia, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, FYR Macedonia, Georgia, Germany, Greece, Hungary, Ireland, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Mongolia,

statistics are available upon request.

Our conceptual framework begins by assuming that a firm's tax compliance decisions are affected by enforcement actions of the tax administration and the firm's view of the difficulties of paying taxes, according to the basic model:

$$Reporting_i = \alpha_i + \beta_1 Tax\ Inspection_i + \beta_2 Taxes\ as\ Obstacle_i + \gamma Z_i + \varepsilon_i, \quad (1)$$

where $Reporting_i$ is the percentage of sales that the respondent firm i believes a "typical" firm reports for tax purposes, $Tax\ Inspection_i$ is a measure of tax enforcement that firm i faces, $Taxes\ as\ Obstacle_i$ is a measure of how large an obstacle to doing business the firm finds taxes, and Z_i denotes a vector of control variables that includes the firm's ownership type (e.g., foreign, domestic, or state), its industry, its sales, the gender of the owner, and the country and year of the survey. The error term is denoted ε_i , and $(\alpha_i, \beta_1, \beta_2, \gamma)$ are estimated parameters. Since the dependent variable is limited between 0 and 100, with a significant number of values equal to 100, we estimate equation (1) with Tobit maximum likelihood estimation. Further, our framework assumes that $Taxes\ as\ Obstacle$ depends in part upon the firm's tax morale ($Tax\ Morale$) via:

$$Taxes\ as\ Obstacle_i = \lambda_1 Z_i + \lambda_2 Tax\ Morale_i + v_i. \quad (2)$$

In principle, both equations can be estimated.

However, there are several significant difficulties. A basic problem is that we have no *direct* information in either BEEPS or WES on a firm's "tax morale". However, we believe that the survey questions contain *indirect* information on a firm's tax morale. We have developed a conceptual approach that allows us to generate this information on tax morale, and then to use this information to examine the impact of tax morale on firm reporting. Also, the variable $Tax\ Inspection$ is included as a measure of tax enforcement, and is based on the survey question of

Montenegro, Poland, Portugal, Romania, Russia, Serbia, Slovak Republic, Slovenia, South Korea, Spain, Tajikistan, Turkey, Ukraine, and Uzbekistan.

whether the firm has been inspected by the tax authorities in the past twelve months; it takes a value of 1 if the firm has been inspected and 0 otherwise. However, simply including this variable will not yield meaningful results because it is likely subject to endogeneity given that the same factors that lead a firm to evade taxes may also draw the attention of the tax authorities.

To deal with potential endogeneity of *Tax Inspection*, we estimate its determinants using a logit regression, and we then use this equation to generate a predicted value for *Tax Inspection*. The logit regression has the form:

$$Tax\ Inspection_i = \eta_1 Electric\ Utility\ Outage_i + \eta_2 Water\ Utility\ Outage_i + \delta D_i + \mu_i, \quad (3)$$

where *Electric Utility Outage_i* and *Water Utility Outage_i* are instruments for tax enforcement, *D_i* is a subset of the exogenous variables from equation (1), μ_i is the error term, and (η_1, η_2, δ) are estimated parameters. The instruments for *Tax Inspection* are chosen to capture the effectiveness of the government in enforcement. *Electric Utility Outage* measures whether the firm has experienced power supply interruption in the past year, and *Water Utility Outage* measures the same interruption for water supply. A well-maintained water and electrical infrastructure is an indicator of a well-functioning government, and such a government should be more effective also at tax enforcement. While utility outages may affect the level of sales, there should be little effect on the amount of sales reported for tax purposes. The over-identification of this estimation provides a test for both instrumental variable assumptions of correlation with the variable of interest (*Reporting*) and orthogonality with the error term.

These regression results capture the variation of tax enforcement due to government effectiveness, and they also enable us to assign a probability of audit for each observation for *Tax Inspection*. By estimating only a predicted probability of audit based on utility services, the logit estimation eliminates the direct correlation between tax enforcement and sales reporting.

Of perhaps more importance is the absence of *direct* information on a firm's "tax morale". To deal with this issue, we use two different approaches that allow us to generate firm-level estimates of tax morale. We start with two survey questions that ask the firm how large an obstacle taxes are for the business. The first question addresses tax rates, asking if tax rates are an obstacle to business (*Tax Rates as Obstacle*); the second question addresses if tax administration is an obstacle to doing business (*Tax Administration as Obstacle*). The answers are based on a scale of 0-3, with 0 being no obstacle and 3 being a major obstacle. We then combine the two measures by using the maximum value of these responses for a new "overall" tax obstacle measure.⁵ After obtaining the "overall" tax obstacle measure, we distill this measure into a binary variable with 0 representing observations where taxes are not an obstacle at all and 1 representing observations where taxes are an obstacle to doing business. This variable is denoted *Taxes as Obstacle*, and is the dependent variable in equation (2).

A number of different factors may affect whether or not a firm deems taxes as an obstacle to doing business. Larger firms with more resources to devote to tax compliance issues may not see taxes as an obstacle while smaller firms find tax issues more difficult to address. Larger firms may instead face more complicated tax and accounting procedures, and thus they may find taxes more of an obstacle. Other firm characteristics (e.g., ownership type) may also affect perceptions.

Importantly, the tax morale of the firm is a necessary component of how large an obstacle to doing business a firm perceives taxes to be. As discussed earlier, tax morale is generally considered to be the *taxpayer's* attitude toward taxes and toward paying their taxes. Our measure of the

5. The maximum value of the two questions is used since the minimum value is not a "binding" value. Consider a combined question that assesses taxes as an overall obstacle. If the respondent believes that tax rates are not a major obstacle but that tax administration is an obstacle, then the firm will report that overall taxes are a major obstacle due to the effect of tax administration alone. In contrast, if these two questions are included separately, then firm might respond that tax rates are a minor obstacle to the first question and that tax administration is a major obstacle to the second question. Therefore, the appropriate way to combine the two separate questions into an overall measure is to take the largest value.

obstacle to doing business encompasses the *firm's* attitude toward taxes and toward paying taxes. A firm with a low antipathy toward paying taxes (e.g., a high tax morale) may still find taxes an obstacle due to other factors. Even so, when compared to a similar firm with a low tax morale that faces the same factors, the high tax morale firm may be less likely to view taxes as an obstacle. A firm with low tax morale that views taxes as an obstacle will report taxes as a major burden to business, and will also be likely to consider cheating on taxes as justified.

Accordingly, taking into account other variables that seem likely to affect the perception of taxes as an obstacle to doing business results in a “true” model of the determinants of *Taxes as Obstacle*, as specified in equation (2). The vector Z_i denotes the same control variables for firm i as specified in equation (1), or the firm’s ownership type, its industry, its sales, the gender of the owner, and the country and year of the survey. Therefore, even in absence of specific BEEPS or WES questions of the morality of cheating on taxes, the measure *Taxes as Obstacle* includes information on the firm’s tax morale, recognizing that it also includes other confounding effects that contribute to overall tax perceptions. If these confounding effects can be identified and included in the estimation, then what remains in the estimated error term should in principle be a measure of a firm’s *Tax Morale*. In effect, the estimated residual error term that remains after controlling for these other effects identifies the firm’s tax morale. We follow this logic in one method to estimate a firm’s *Tax Morale*, which we denote the “Residual Identification Approach”.

Of course, this Residual Identification Approach is subject to the usual problems associated with omitted variables; that is, if our control variables omit some relevant determinants, then our estimated residual will be a less precise measure of tax morale. With omitted variable bias, the true effect of a variable of interest is confounded by factors that affect both the dependent and independent variables. As is well known, isolating the effect of the independent variable requires

using an instrument that is correlated with the factor being measured by the independent variable and orthogonal to the dependent variable, in order to capture the portion of the variation in the independent variable associated with the factor of interest. In this respect, *Taxes as Obstacle* can be viewed as an imperfect measure of tax morale that suffers from omitted variable bias. Similarly, with the tax obstacle measure, the impact of tax morale is potentially affected by other factors.

An alternative approach to finding a firm-level estimate of *Tax Morale* therefore involves using standard instrumental variables, or an “IV Approach”. By choosing an instrument that is correlated with *Tax Morale* but is also orthogonal to our ultimate variable of interest (or firm tax compliance), a first stage regression can be estimated that identifies only the effects of *Tax Morale* on *Taxes as Obstacle*.

The relationship between tax morale and trust in government provides a potential instrument that can be used to isolate the effect of tax moral from the tax obstacle measure. Torgler and Schneider (2007) argue that citizens are more willing to pay their taxes when they believe that their interests are adequately reflected in public institutions. Put differently, greater trust in government seems likely to lead to greater tax morale. Alm, Jackson, and McKee (1993) and Alm, McClelland, and Schulze (1999) present experimental evidence also consistent with this argument.

Consequently, we identify tax morale via the specification:

$$Taxes\ as\ Obstacle_i = \lambda Z_i + \lambda_2 Judiciary\ as\ Obstacle_i + v_i, \quad (4)$$

where *Judiciary as Obstacle_i* is the perception by firm *i* of the functioning of the judiciary as an obstacle to doing business. A well-functioning judiciary should provide little obstacle to business and so should indicate good governance that will be associated with high tax morale. Conversely, a corrupt judiciary creates a large obstacle to business, and will be associated with low trust and low tax morale. This measure of the legal system as an obstacle to business should be orthogonal to tax

compliance as levels of corruption or integrity are exogenous to the firm, and is accordingly used as the instrument to identify *Tax Morale*. As with a traditional instrumental variable approach, the predicted values of *Taxes as Obstacle* provide an alternative estimate of *Tax Morale*.⁶

We then use our two alternative estimates of *Tax Morale* as one of several explanatory variables for *Reporting*, in order to examine the impact of tax morale on firm tax compliance. We expect a positive value for tax morale on reporting, given that higher values of *Tax Morale* indicate a stronger intrinsic motivation to pay taxes while higher values of the dependent variable *Reporting* (or the percentage of sales reported for tax purposes) indicate more compliance.

IV. RESULTS

Results from the first stage regressions that partial out the effect of firm characteristics on the perception of *Taxes as Obstacle* and *Tax Inspection* using our two approaches can be found in Tables 1 and 2. These regressions use industry and country fixed effects, which are not reported. All regressions give relatively good fits. In Table 1 for the Residual Identification Approach, the pseudo-R² is 0.0786 for the *Taxes as Obstacle* regression and 0.1816 for the *Tax Inspection* regression; similar results for the IV Approach in Table 2 are 0.1547 and 0.1895.

Consider first the *Taxes as Obstacle* regression (Table 1). Both foreign and state owned firms are likely to find taxes less of an obstacle than domestically owned firms, the omitted category. Foreign owned firms likely have significant resources with which they can address any tax complications. Further, some multinationals may not be subject to the same tax regulations or

6. In using the instrumental variable approach, particular care should be taken with the standard errors. In our case, the instrumented variable (*Tax Morale*) is binary in nature, which causes some complications since standard instrumental variable estimators such as 2SLS employ a linear first stage estimate. To account for the binary nature of the instrumented variable, we use a probit specification, with the predicted probabilities from the first stage instrumenting for the variable of interest in the second stage. While this produces unbiased and consistent estimates, standard errors must still be adjusted for the two stage procedure. We follow the procedure discussed in Wooldridge (2002) to generate the correct standard errors.

may be able to reduce tax burden through methods such as transfer pricing, and thus will not view taxes as a significant obstacle to business. Likewise, state owned corporations may receive favorable tax treatment due to their status, and thus not find taxes a large obstacle to business. Additionally, state owned corporations may not be driven by profit maximization, in which case taxes will not be as important to doing business as for privately held enterprises.

As firms grow larger, as measured by the log of total sales, the more likely they come to find taxes as an obstacle. This could be expected in a progressive tax structure, as smaller firms would face lower tax liability, even though most corporate tax systems are not especially progressive. Another explanation for this could include that, as a firm grows in sales, it attracts more attention of the tax authority because higher sales represent potentially higher revenues. Similarly, smaller firms could find it easier to avoid the attention of the tax authority as the tax authority at some point faces diminishing returns in pursuing smaller businesses.

Contrary to the hypothesis that a little corruption tends to “grease” the wheels of bureaucracy, corruption in the tax administration system, as measured by the firm’s report of *Bribes to Deal with Taxes*, is associated with taxes being perceived as an obstacle to business. The uncertainty and delays that arise in corrupt tax administration impose additional costs on businesses, and these costs are translated into businesses obstacles. A corrupt tax administration may also be indicative of a poorly functioning system in general. In this case, even if a firm was faced with minor bribery to deal with taxes that did not create large obstacles, they would also have to deal with general incompetency that creates obstacles to business in and of itself.

Similarly, a complex tax code, as proxied by the percentage of time that senior management spends dealing with laws and regulations (*Time on Regulations*), increases the perception of taxes as an obstacle to business. While this measure does not directly measure the complexity of the tax

code, often the tax code is one of the more complex laws with which firms must comply. Therefore, if firms spend large amounts of time dealing with complex laws and regulations, it is reasonable to suspect that the tax code is a part of this complexity.

After estimating the predicted value of attitudes toward taxes conditional on these observables, standardized Pearson residuals (or the raw residuals scaled by the standard deviation of the observation) are calculated to obtain the Residual Identification Approach measure of *Tax Morale*. Summary statistics indicate that tax morale is skewed positively toward tax compliance; that is, firms are more likely than not to hold the attitude that evading taxes is wrong.

For the first stage regressions on *Taxes as Obstacle* in the IV Approach (Table 2), the results for main control variables (e.g., ownership type, sales, bribes, time on regulations) are essentially the same as in Table 1. As for the instruments, the main instrument for identification, *Judiciary as Obstacle*, is significant at the 1 percent level in the *Taxes as Obstacle* regression, suggesting that a poorly run judiciary creates obstacles to doing business and is associated with a tax system that creates obstacles. The other two instruments (*Electric Utility Outage* and *Water Utility Outage*) are also significant in the *Taxes as Obstacle* first stage regression. Again, these results are used to generate the IV Approach measure of *Tax Morale*. As for the *Tax Inspection* first stage estimation in Table 2, *Judiciary as Obstacle* is significant at the 1 percent level, as are the utility outage instruments, again suggesting that they are strong instruments.

Statistics regarding the validity of the instruments of *Tax Inspection* and *Taxes as Obstacle* are in Table 3. These results show that the instruments chosen are valid. Underidentification is strongly rejected for both regressions, while the overidentification test for the *Tax Inspection* regression confirms that the instruments are exogenous to tax inspection rates.⁷ For the *Tax*

7. The joint-null hypothesis for the Sargan-Hansen test of overidentifying restrictions is that the instruments are uncorrelated with the error term and that the excluded instruments are correctly excluded from the estimated

Inspection regression, the weak identification statistic for the two utility outage variables does not exceed the Stock and Yogo (2005) critical value for 15 percent maximal IV size, indicating that the instruments (while valid) are weak. However, for the *Taxes as Obstacle* regression, the instrument far exceeds the critical value, indicating that the effectiveness of *Judiciary as Obstacle* is a strong instrument for *Taxes as Obstacle* and ultimately for *Tax Morale*.

Table 4 provides a robustness check for the two measures of *Tax Morale* that are generated from our two approaches. Previous literature has shown that tax morale and confidence in government are related. To test the measures of tax morale, correlation coefficients for several measures of confidence in government are provided: the functioning of the judiciary (*Judiciary as Obstacle*), *Corruption as Obstacle* to doing business (a categorical variable with four options from no obstacle to major obstacle), and *Consistent Interpretation of Laws* (a categorical variable with four options from strongly disagree to strongly agree). All three measures are highly correlated with the alternative measures of *Tax Morale* and have the expected sign (e.g., more corruption and a poorly functioning legal system are associated with low tax morale, a consistent law interpretation is associated with high morale). The correlation coefficient for the two measures of tax morale is also provided in Table 4. While the correlation is only 0.1633, it is positive and highly significant.

Table 5 presents the main estimation results, for the determinants of *Reporting* in equation (1). We present six specifications for comparison purposes. We first estimate two initial base specifications using OLS (Model 1) and Tobit (Model 2) estimators without instrumentation of *Tax Inspection*, with the raw survey measure of *Taxes as Obstacle*, and with no attempt to identify separately any effects of tax morale on firm tax evasion. Next, we present both Two Stage Least Squares (2SLS) and Tobit results using the Residual Identification Approach to tax morale (Model 3) and with the instrumented estimates of *Tax Inspection* (Model 4). Finally, we report both 2SLS

equation. Failure to reject the null indicates valid instruments.

(Model 5) and Tobit (Model 6) specifications using the IV Approach to tax morale and also with the instrumented estimates of *Tax Inspection*.⁸

Estimates from all six specifications show that foreign firms and state owned firms engage in more reporting and so less tax evasion than domestic owned firms, and that larger firms also report more sales than smaller firms. For example, coefficient estimates in Model 4 indicate that a foreign owned firm reports 6.88 percentage points more of its income than domestic firms, while state owned firms report 11.71 percentage points more of revenue for tax purposes than privately owned firms. Additionally, a one percent increase in revenue increases revenue reported for tax purposes by 3.77 percentage points, so that larger firms are more compliant. Other models give similar qualitative results. These results are not surprising as foreign firms, possibly faced with higher penalties for cheating, will seek higher compliance with the tax code. State owned firms do not face the same profit motives as privately owned firms, and therefore do not face the same incentives for tax evasion. Additionally, being state owned, these firms' interests are aligned with those of the government, and presumably these interests do not include lower revenue due to tax non-compliance. Larger firms may have greater resources to devote to tax evasion, but they also face greater obstacles to evasion. As an enterprise grows larger and employs more individuals, opportunities for evasion diminish and reputation risk become much more of a factor. Further, foreign ownership and large firms are characteristics that are generally accompanied by higher transparency standards, particularly for multinationals participating in the global market, thus reducing the opportunity and incentive to evade. Tax evasion is consistent across industry types as the industry results, not reported, are generally not significant.

⁸ All specifications include country fixed effects, and these estimates are generally similar across the different specifications. Although the magnitude and significance fluctuate slightly by specification, the signs of the country fixed effects remain largely the same. For example, the fixed effects for Model 4 indicate that firms in more developed countries (e.g., Germany or South Korea) tend to engage in more evasion, while Russia and other former Eastern Bloc have somewhat lower levels of evasion.

A corrupt tax administration system (*Bribes to Deal with Taxes*) reduces *Reporting* and so increases tax evasion in all specifications, with firms that reported bribing a tax official reporting as much as 15 percentage points less revenue than firms that had not engaged in bribery (Model 4). A firm engaged in tax evasion may find it necessary to bribe officials if faced with a potential audit.

A more complex tax system (*Time on Regulation*) is associated with less reporting and greater tax evasion in all specifications, with a ten percentage point increase in time spent on regulations associated with a 1.6 percentage point decline in revenue reported for taxes (Model 4). This result is consistent with Nur-tegin (2008), who uses BEEPS data (a subset of our data set) and also finds a small but significant effect of tax complexity on evasion reporting.

Tax Inspection is not significant when its potential endogeneity is not recognized (Models 1 and 2). Even when it is instrumented, it is significant only for the IV regression using the Residual Identification Approach (Model 3). This insignificance is likely due to the instruments chosen. While the instruments are highly correlated with tax inspection and thus valid, they are weak instruments and do a relatively poor job in explaining overall variation, with a partial R-squared from the first stage regressions of only 0.009 and a Kleibergen-Paap F statistic of only 3.82. As a result, the effect of only a small fraction of the actual audit rate facing firms is estimated.

Of most interest here, *Tax Morale* has the expected positive sign and is statistically significant in all of the correct specifications (Models 3, 4, 5, and 6). (Recall that an increase in *Tax Morale* indicates a decrease in the firm's antipathy toward taxes.) For example, in Model 4 a one point increase in tax morale leads to a 1.9 percentage point increase in sales reported for taxation. Similarly, in Model 6 (or the IV Approach) the measure of tax morale is positive and significant at the one percent level for both specifications, and now has a much larger impact; for example, in Model 6 a one point increase in tax morale is associated with a 28.2 percentage point increase in

revenue reported. Estimates of such magnitude indicate that maintaining a high tax morale is an important consideration for governments seeking to increase tax compliance. The implications of these findings are discussed in the final section.

V. CONCLUSIONS

Our results are largely in line with previous work focusing on individuals, demonstrating a strong connection between the decisions individuals make for themselves and the decisions individuals make through their firms. Ultimately, firms are subject to the same tax morale considerations that individuals face when dealing with their personal taxes. Just as with individuals, firms that have higher tax morale, and thus believe evading taxes is wrong, evade less than firms that have lower tax morale.

Our estimates also provide clear evidence that suggests several options to increase tax collections, or at least to better focus tax administration efforts. Given that our results show that foreign firms and state owned firms engage in more reporting and less tax evasion than domestic owned firms, government should concentrate its audit efforts on domestic firms. However, our results also show that enforcement efforts (even if better focused) seem to have relatively little impact on reporting. Other policies that have a greater (and positive) impact on reporting include reducing various obstacles to compliance, especially corruption and complexity, thereby providing better taxpayer services and making it easier for firms to pay their taxes.

Of perhaps most importance, our results indicate the crucial role of tax morale in firm compliance: improvements in tax morale have a significant – and positive – impact on reporting. Although specific government policies to improve tax morale remain somewhat elusive, other work (Alm, 2011) has shown that such policies for *individuals* include: emphasizing that paying taxes is

the “right” thing to do, publicizing cheaters, stressing the link between the payment of taxes and the receipt of government services, encouraging greater participation in the process by which the use of taxes is determined, addressing perceived inequities in tax treatment, and avoiding policies that suggest that cheating is morally acceptable. A main lesson of our work is that tax morale considerations apply to both individuals and firms, so that policies directed to *individuals* should have similar effects on *firms*. In particular, if tax audits are the “stick” of tax enforcement, then these alternative approaches could be the complementary “carrot” used to improve tax compliance.

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Table 1 First Stage Regressions – Residual Identification Approach

Independent Variable	Dependent Variable	
	Taxes as Obstacle	Tax Inspection
Ownership – Foreign	-0.186*** (0.0660)	0.0399 (0.0437)
Ownership – State	-0.656*** (0.0760)	-0.0346 (0.0605)
Ln(Total Sales)	0.0382*** (0.00999)	0.115*** (0.00656)
Bribes to Deal with Taxes	0.427*** (0.0430)	0.208*** (0.0271)
Time on Regulations	0.00905*** (0.00175)	0.00153 (0.000945)
Electric Utility Outage		0.101*** (0.0280)
Water Utility Outage		0.114*** (0.0428)
Constant	0.0751 (0.427)	-1.411*** (0.353)
Observations	21188	12085
Pseudo R ²	0.0786	0.1816

Standard errors are in parentheses. Industry and Country fixed effects are not reported.

Table 2 First Stage Regressions – IV Approach

Independent Variable	Taxes as Obstacle	Tax Inspection
Ownership – Foreign	-0.0932** (0.0432)	0.0519 (0.0451)
Ownership – State	-0.307*** (0.0491)	-0.0129 (0.0617)
Ln(Total Sales)	0.0107 (0.00695)	0.112*** (0.00676)
Bribes to Deal with Taxes	0.377*** (0.0298)	0.191*** (0.0281)
Time on Regulations	0.00167 (0.00113)	0.00121 (0.000975)
Judiciary as Obstacle	0.402*** (0.0152)	0.0685*** (0.0126)

Electric Utility Outage	0.150*** (0.0298)	0.0956*** (0.0289)
Water Utility Outage	0.0828* (0.0426)	0.123*** (0.0442)
Constant	-0.415 (0.257)	-0.864** (0.437)
Observations	15572	11431
Pseudo R ²	0.1547	0.1895

Standard errors are in parentheses. Industry and Country fixed effects are not reported.

*** p<0.01, ** p<0.05, * p<0.1

Table 3 Tests for Instrument Validity

	Linear Probability Model: Tax Inspection	Linear Probability Model: Tax Morale
Underidentification test		
Kleibergen-Paap rk LM statistic	7.68 (0.0215)	519.95 (0.000)
Kleibergen-Paap rk Wald statistic	7.69 (0.0214)	558.94 (0.000)
Overidentification Test		
Hansen J Statistic	2.12 (0.1453)	NA
Weak identification test		
Kleibergen-Paap rk Wald F statistic	3.820	556.40
15% maximal IV size Critical Value	11.59	12.59
Partial R ²	0.0009	0.0373

Standard errors are in parentheses. “NA” denotes Not Applicable.

Table 4 Tax Morale – Selected Correlation Coefficients

	Tax Morale: Residual Identification Approach	Tax Morale: IV Approach
Corruption as Obstacle	-0.2099***	-0.5179***
Judiciary as Obstacle	-0.2038***	-0.6538***
Consistent Interpretation of Laws	0.1069***	0.2183***
Tax Morale – IV Approach	0.1633***	1.0000***

*** p<0.01.

Table 5 Estimation Results: Determinants of Reporting

	1 OLS Estimation	2 Tobit Estimation	3 2SLS: Residual Identification Approach	4 Tobit: Residual Identification Approach	5 2SLS: Tax Morale – IV Approach	6 Tobit: Tax Morale – IV Approach
Ownership – Foreign	1.690*** (0.519)	6.698*** (1.544)	1.547*** (0.576)	6.881*** (1.650)	1.263** (0.572)	5.432*** (1.607)
Ownership – State	2.689*** (0.731)	12.18*** (2.307)	2.321*** (0.798)	11.71*** (2.377)	1.792** (0.808)	8.887*** (2.152)
Ln(Total Sales)	1.026*** (0.0903)	2.750*** (0.247)	1.634*** (0.319)	3.765*** (0.745)	1.486*** (0.311)	3.120*** (0.721)
Bribes to Deal with Taxes	-5.577*** (0.401)	-15.95*** (0.898)	-4.862*** (0.561)	-14.96*** (1.275)	-4.274*** (0.536)	-12.10*** (1.240)
Time on Regulations	-0.0892*** (0.0307)	-0.177*** (0.0609)	-0.075** (0.0326)	-0.164** (0.0651)	-0.0754** (0.0335)	-0.154*** (0.0564)
Tax Inspection	-0.485 (0.384)	-1.066 (0.946)				
Taxes as Obstacle	-1.294*** (0.402)	-6.243*** (1.202)				
Tax Morale			0.323* (0.195)	1.916*** (0.515)	5.056** (1.996)	28.23*** (5.097)
Tax Inspection (instrumented)			-13.49** (6.292)	-22.66 (14.47)	-9.688 (6.335)	-5.876 (14.31)
Constant	86.76*** (3.011)	116.73*** (5.128)	90.842*** (3.787)	109.829*** (5.962)	91.47*** (2.760)	129.9*** (7.181)
Observations	8850	8850	8645	8645	8269	8269
R ² /Pseudo R ²	0.139	0.035	0.024	NA	0.068	NA

Standard errors are in parentheses. Industry and Country fixed effects are not reported. “NA” denotes Not Applicable.

*** p<0.01, ** p<0.05, * p<0.1