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Effects of supervision on tax compliance: Evidence from a field experiment in Austria

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Abstract: *The tax compliance literature has mainly focused on individual tax evasion rather than firm tax evasion. In general, there is a lack of field experiments on the topic, and measuring tax compliance is challenging. To address this shortcoming in the literature, we conduct a field experiment on firm tax compliance looking at newly founded firms. As a novelty we explore how firms react to closer supervision by the tax administration, looking at timely paying which has no measurement biases. Interestingly, we observe a crowding-out effect of supervision on timely paying of taxes. On the other hand, for those who were non-compliant, supervision reduced the tax amount that was due.*

Keywords: tax compliance, tax evasion, field experiment, deterrence, tax enforcement, supervision

JEL code: H26, C93, K42

1. Introduction

Taxes are important to finance the provision of public goods. To ensure sufficient tax funds, tax authorities enforce compliance mainly by inducing fear via audits and fines (Allingham & Sandmo 1972; Srinivasan 1973). Meta and overview studies report the tendency that deterrence reduces tax evasion (Fischer *et al.* 1992; Alm 1999; Blackwell 2010). However, the effect is small or even negligible (Andreoni *et al.* 1998; Kirchler 2007). It has also been stressed that deterrence may crowd out the intrinsic motivation of paying taxes (Feld & Frey 2002; Torgler 2002; Kirchler *et al.* 2008).

Most of the empirical research on tax compliance is based on surveys analysing individual taxpayer self-reports and laboratory experiments working mainly with students whereas evidence focusing on firms is limited (Torgler 2002; Alm & McClellan 2012). This is particularly important as firms or self-employed people have more opportunities to engage in tax evasion and are reported to have a lower tax morale (Torgler 2007). Laboratory experiments have been criticized for their lack of generalizability. On the other hand, while very reliable field data is available such as that from the Taxpayer Compliance Measurement Program of the IRS, it only provides the chance to explore limited questions and restricts the ability to explore causal relationships. Thus, controlled field experiments have recently emerged as they evoke real processes outside a laboratory while avoiding an experimental demand effect, and with the aim of generating causal effects (Blumenthal *et al.* 2001; Selmrod *et al.* 2001; Torgler 2004; Kleven *et al.* 2011).

To the best of our knowledge, there are only four studies that have manipulated deterrence in the field (Schwartz & Orleans 1967; Slemrod *et al.* 2001; Hasseldine *et al.* 2007; Kleven *et al.* 2011). However, these studies mostly have individual taxpayers as subjects; and manipulate deterrence through questions, prior audits, or through letters announcing audits in order to emphasize a higher perception of audit probability (threat-of-audit letter). Hasseldine et al. (2007) report a positive impact of deterrence on tax behaviour while Kleven et al. (2011) find a modest impact. In contrast, Schwartz and Orleans (1967) find no effect whereas Slemrod et al. (2001) observe a small positive effect for low and middle income groups and a negative impact on high income taxpayers. However, perceived audit probability may differ from the manipulated audit probability (Slemrod *et al.* 2001; Mittone 2006). For example, one cannot be sure that the taxpayers actually read the letter. Additionally, the letters themselves could be perceived as unfriendly, causing a reluctant reaction from taxpayers because of the unfriendly communication and not just due to

deterrence itself. Also, using reported taxable income, net profit, or deductions as measures of compliance can be problematic as they do not directly measure tax non-compliance (no information on taxpayer return audits). Moreover, earnings generated in the informal sector do not appear in the reported taxable income. Audits also struggle to detect tax evasion through informal activities which leads to measurement biases in tax evasion and therefore lower-bound estimates (Kleven *et al.* 2011).

The strength of our study is that it provides further evidence on tax compliance using firm data and conducting a field experiment. In addition, as a novelty we explore the influence of close tax administration supervision on compliance. Supervision is defined as a friendly and constant form of deterrence and interaction with the firms. This allows to control for the awareness of the auditing while avoiding communication that is perceived as unfriendly. To reduce any firm specific experiences with the tax administration we focus only on newly founded firms. In addition, we explore firms that are classified as high risk groups in regards to tax evasion. To avoid tax compliance measurement biases we explore the timely paying of taxes and the amount of the delayed taxes that were not paid.

2. Sample

The sample consists of all the 1,721 firms that began operation within the year 2011 in the tax district "East-Styria" in Austria. Each of these businesses were obliged to pay their full taxes before November 15, 2012. Ninety-three of these firms were randomly selected to compose the treatment group that we call "supervision". These supervised firms mostly belong to high-risk businesses in terms of tax evasion (gastronomy: 54.8%, construction: 22.6%, trading: 19.4%, mining: 1.1%, counselling: 1.1%). The remaining 1,628 enterprises comprise the non-treatment group of which 35.5% are high risk businesses (gastronomy: 4.2%, construction: 6.4%, trading: 14.5%, mining: 0.1%, counselling: 10.3%) and 65.5% low risk businesses, mostly in the real estate (19.6%), service (8.2%) and agriculture business (7.2%). One should note that we will present results limiting this control group to only those who appear in the treatment group. Most enterprises had a turnover of up to 29,999 Euro (treatment group: 62.2%, non-treatment group: 85.7%). Finally, the majority of firms had the legal status of a natural person (treatment group: 79.6%, non-treatment group: 74.4%) and an employed tax practitioner (treatment group: 86.0%, non-treatment group: 65.5%). In a multivariate analysis we control for the legal status of a firm.

3. Procedure and Measurement

The supervision consisted of two parts: (a) an introductory visit, and (b) constant auditing throughout the first year of the firm. Both phases were conducted and administered by a tax auditor. The introductory visit at the firm took place following a firm's application for a tax number. The tax auditor advised the firm on the tax law and the subsequent rights and duties of a taxpayer, handed out information brochures and give-aways (a pen, a pad, and a candy). The tax auditor explicitly used friendly and respectful communication and invited the firms to contact the auditor in case further questions emerged. Importantly, the auditor informed the firm that he/she would audit the reporting and paying liabilities on a monthly basis throughout the year. Thus, the constant auditing part ensured that the tax auditor monitored the tax files of the enterprise each month according to the Austrian tax law. All other firms that were not part of the treatment were deliberately not contacted, informed, or audited by the tax authorities.

4. Measurements

According to the IRS, tax compliance comprises three aspects: accurate reporting, timely filing, and timely paying (Slemrod *et al.* 2001). As mentioned previously we only focus on timely paying as the quality and frequency of an audit make accurate reporting comparatively hard to assess. The timely paying variable has no measurement errors as one is able to assess whether a taxpayer paid before or after the deadline. In Austria, firms have until November 15 to pay. Thus, we compiled the anonymized tax accounts of December 15, 2012 including all taxes from 2011 (VAT, income tax, property tax etc.). Obviously at this date, all taxes owing can be considered as late. Accordingly, timely paying is assessed as a dichotomous (paid in time or not) and a continuous (amount of tax due for those who are late) variable. The continuous variable was logarithmized to take into account the skewed distribution of the variable's values (skewness = -1.98).

Additionally, we clustered the analyses over the business sector and included the turnover, the legal status, and whether they have used a tax practitioner as control variables. The possibility of tax evasion is seen as one of the most important determinants of tax compliance (Engström & Holmlund 2009; Kleven *et al.* 2011). Businesses such as gastronomy, construction or trading operate with cash and have increased opportunities to engage in tax evasion than, for example, real estate businesses. The legal status allows us to differentiate between one-person enterprises and larger enterprises. Finally, the tax practitioner is an important factor for tax compliance. There is evidence that tax practitioners

increase non-compliance (Erard 1993) and that changes in tax authorities' interaction style influence tax compliance of taxpayers who self-prepare their taxes but not of those who employ a tax practitioner (Hasseldine *et al.* 2007).

5. Results

In the following, two regression analyses are presented. First we use a probit model to explore whether our treatment has an influence on timely paying (*Table 1*). We then restrict our sample to those cases where firms did not pay on time, using OLS specifications to analyse whether the treatment influences the amount of the delayed tax (*Table 1*). In specification (1) we first investigate only our treatment dummy variable, estimating robust standard errors. The results show that supervision increases the delay in payment by 15.5 percent. In the next five specifications (2-6) standard errors are clustered by business sectors to capture unobserved sector-specific characteristics. We sequentially increase the number of control variables to check the robustness of our treatment variable. First we add the turn-over (2), followed by the legal status (3) and a dummy indicating whether the firm uses a tax practitioner or not. The results report that the coefficient for our treatment variable is always statistically significant at the 1% percent level with a marginal effect of 11 percent. Finally, specification (6) provides a further robustness check by restricting the control group sample to only those industries that appear in the treatment group (high risk firms). Again we observe that the coefficient is statistically significant, although with a slight decrease in the marginal effects (9.2 percentage points). Thus, the results indicate that the supervision actually crowds-out compliance.

In *Table 2* we only explore the amount of tax owed by non-compliant firms (those that did not pay on time). Here we actually observe that supervision has a positive effect, reducing the amount of tax due. We follow the approach adopted in Table 1, sequentially increasing the number of observations. In specifications (7) to (11) we again cluster over business industries. While the coefficient is on the border of statistical significance in the first two specifications (7-8), the coefficient is far from being statistically significant in the next two specifications once we control for further factors (9-10). However, when we restrict our sample to the business industries (as in the control group) the coefficient becomes highly statistically significant.

Table 1
Effect of supervision on not paying on time

	Clustering over business sector					
Probit	(1)	(2)	(3)	(4)	(5)	(6)
Supervision	0.568***	0.571***	0.495***	0.475***	0.450***	0.327***
	3.94	*4.64*	*4.96*	*4.68*	*4.76*	*5.24*
	0.154	**0.155**	**0.129**	**0.120**	**0.112**	**0.092**
30,000-90,999 Euro turnover			0.448*	0.420*	0.395*	0.129
			2.59	*2.34*	*2.14*	*0.66*
			0.113	**0.102**	**0.095**	**0.034**
100,000-219,999			0.300	0.184	0.166	0.009
Euro turnover			*1.30*	*0.77*	*0.69*	0.04
			0.073	**0.041**	**0.037**	**0.002**
220,000-699,999			0.194	-0.035	-0.064	-0.066
Euro turnover			*0.71*	*-0.13*	*-0.23*	*-0.19*
			0.045	**-0.007**	**-0.012**	**-0.016**
700,000-9.679,999			0.702**	0.422^{+}	0.396	-0.069
Euro turnover			*3.20*	*1.69*	*1.58*	*-0.34*
			0.201	**0.106**	**0.098**	**-0.017**
Natural person				0.513**	0.527**	0.880*
				3.02	*3.19*	*2.57*
				0.089	**0.091**	**0.179**
Limited liability corporation				0.975***	0.941***	1.266**
				4.60	*4.39*	*3.29*
				0.283	**0.270**	**0.428**
Limited partnership				0.083**	0.799**	0.966^{+}
				2.80	*2.79*	*1.83*
				0.241	**0.231**	**0.330**
Commercial corporation				0.570^{+}	0.556^{+}	1.012*
				1.69	*1.67*	*2.09*
				0.152	**0.147**	**0.348**
Tax practitioner					0.171^{+}	0.233
					1.66	*1.54*
					0.033	**0.056**
Observations	1721	1713	1713	1713	1713	714
Pseudo R^2	0.0110	0.0112	0.0276	0.0497	0.0523	0.0368

Notes: z-values are given in italics, marginal effects in bold. $^{+}$, *, **, *** represent statistical significance at the 10 (p<.10), 5 (p<.05), 1 (p<.01) and 0.1 (p<.001) levels, respectively; the reference group of turnover is 0-29,999 Euro, the reference group for legal status consists of all the other possibilities (club, business partnership, consortium, civil law association, capital company, hiring association, silent partnership, house owner association).

Table 2
Effect of the supervision on the amount of delayed tax payment

	Clustering over business sector				
OLS regression	(7)	(8)	(9)	(10)	(11)
Supervision	-0.684^{+}	-0.591^{+}	-0.302	-0.311	-0.699***
	-1.93	*-2.00*	*-1.15*	*-1.08*	*-3.84*
30,000-90,999 Euro turnover		-0.137	-0.207	-0.223	-1.194
		-0.22	*-0.36*	*-0.37*	*-1.35*
100,000-219,999 Euro turnover		-1.390	-0.716	-0.714	-0.684
		-.088	*-.069*	*-0.68*	*-0.58*
220,000-699,999 Euro turnover		2.504***	2.579***	2.565***	1.817*
		8.78	*5.22*	*5.18*	*3.85*
700,000-9.679.999 Euro turnover		-0.060	0.116	0.101	-0.903
		-0.06	0.10	0.09	*-0.43*
Natural person			-0.364	-0.361	0.053
			-0.79	*-.0.80*	*0.30*
Limited liability corporation			-0.889	-0.904	-0.102
			-1.21	*-1.21*	*-0.15*
Limited partnership			0.890	0.882	0.442
			1.17	*1.14*	*1.11*
Commercial corporation			-3.566	-3.571	-3.509
			-1.60	*-1.61*	*-1.42*
Tax practioner				0.084	-0.31
				0.18	*-0.66*
Observations	227	227	227	227	130
R^2	0.006	0.035	0.079	0.079	0.1594

Notes: t-values are given in italics $^{+}$. *, **, *** represent statistical significance at the 10 (p<.10), 5 (p<.05), 1 (p<.01) and 0.1 (p<.001) levels, respectively; the reference group of turnover is 0-29,999 Euro, the reference group of for legal status consists of all the other possibilities (club, business partnership, consortium, civil law association, capital company, hiring association, silent partnership, house owner association).

6. Discussion

The reported results indicate that supervision can backfire. Rather than increasing tax compliance, even a friendly version of deterrence reduces tax compliance. Thus, supervision seems to crowd out the intrinsic motivation of tax compliance (Feld & Frey 2002; Torgler 2002; Kirchler *et al.* 2008). It might be that such interventions are perceived to be too controlling, which reduces self-determination and self-esteem, thereby decreasing intrinsic motivation. Such an effect is observed in the literature on work morale (Frey 1997a). There is also evidence that sanctions are perceived as a "price". For example, Gneezy and Rustichini (2000) observe that the introduction of a fine for parents arriving late to a day-care centre was perceived as a price rather than as a sign to encourage on-time collection of children. Therefore, delayed pick-up of children increased and was persistent even after removing the fine.

Thus, it does not seem that this external intervention has been perceived as supportive despite the fact that it was a more personal relationship between the tax administration and the taxpayer which could have reduced such a crowding-out effect of the firm's intrinsic motivation to pay taxes (Frey 1997b). On the other hand, for those who were non-compliant, supervision tends to reduce amount of late taxes due, particularly when restricting the sample size to high risk industries.

However, this study has some limitations. The present outcomes might not apply to countries with a different tax culture to Austria (Alm & Torgler 2006). Also, the relatively small sample size of our treatment group makes it necessary to replicate the current outcome with a larger treatment sample and in other countries. It might be argued that supervised firms have adapted their behaviour due to additional information generated (e.g., better understanding of the sanctions for late paying which are not that severe after all). Additionally, it can be argued that the inexperienced non-treatment group faced a much more ambiguous situation than the supervised firms causing them to perhaps to be more risk averse with respect to reporting, and as a result more tax compliant.

Based on empirical evidence, tax authorities are recommended to invest in further services such as telephone hotlines or a website to increase tax compliance (Braithwaite *et al.* 2007; Alm & Torgler 2011; Gangl *et al.* in press). Future research could study the effects of such services in the field to determine whether it is possible to generalize the positive impact of "soft-factors" reported in survey and laboratory studies.

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References:

Allingham, M.G., Sandmo, A., 1972. Income tax evasion: A theoretical analysis. Journal of Public Economics 1, 323-338

Alm, J., 1999. Tax compliance and administration. In: Hildreth WB & Richardson JA (eds.) Handbook on Taxation. Dekker, New York, NY, pp. 741-768.

Alm, J., McClellan, C., 2012. Tax morale and tax compliance from a firm's perspective. Kyklos 65, 1-17

Alm, J., Torgler, B., 2006. Culture differences and tax morale in the United States and in Europe. Journal of Economic Psychology 27, 224-246

Alm, J., Torgler, B., 2011. Do ethics matter? Tax compliance and morality. Journal of Business Ethics 101, 635-651

Andreoni, J., Erard, B., Feinstein, J., 1998. Tax compliance. Journal of Economic Literature 36, 818-860

Blackwell, C., 2010. A meta-analysis of incentive effects in tax compliance experiments. In: Alm J, Martinez-Vazquesz J & Torgler B (eds.) Developing alternative frameworks for explaining tax compliance. Routhledge, London, UK, pp. 97-112.

Blumenthal, M., Christian, C., Slemrod, J., 2001. Do normative appeals affect tax compliance? Evidence from a controlled experiment in Minnesota. National Tax Journal 54

Braithwaite, V., Murphy, K., Reinhart, M., 2007. Taxation threat, motivational postures, and responsive regulation. Law & Policy 29, 137-158

Engström, P., Holmlund, B., 2009. Tax evasion and self-employment in a high-tax country: Evidence from Sweden. Applied Economics 41, 2419-2430

Erard, B., 1993. Taxation with representation: An analysis of the role of tax practioners. Journal of Public Economics 52, 163-197

Feld, L.P., Frey, B.S., 2002. Trust breeds trust: How taxpayers are treated. Economics of Governance 3, 87-99

Fischer, C.M., Wartick, M., Mark, M.M., 1992. Detection probability and taxpayer compliance: A review of the literature. Journal of Accounting Literature 11, 1-46

Frey, B.S., 1997a. A constitution for knaves crowds out civic virtues. The Economic Journal 107, 1043-1053

Frey, B.S., 1997b. Not just for the money. An economic theory of personal motivation. Edward Elgar, Cheltham, UK.

Gangl, K., Muehlbacher, S., Antonides, G., Goslinga, S., de Groot, M., Hofmann, E., Kirchler, E., Kogler, C., in press. "How can I help you? Perceived service orientation of tax authorities and tax compliance". FinanzArchiv

Gneezy, U., Rustichini, A., 2000. A fine is a price. Journal of Legal Studies 29, 1-17

Hasseldine, J., Hite, P., James, S., Toumi, M., 2007. Persuasive communication: Tax compliance enfrocement strategies for sole proprietors. Contemporary Accounting Research 24, 171-194

Kirchler, E., 2007. The economic psychology of tax behaviour. University Press, Cambridge.

Kirchler, E., Hoelzl, E., Wahl, I., 2008. Enforced versus voluntary tax compliance: The "slippery slope" framework. Journal of Economic Psychology 29, 210-225

Kleven, H.J., Knudsen, M.B., Kreiner, C.T., Pedersen, S., Saez, E., 2011. Unwilling or unable to cheat? Evidence from a tax audit experiment in Denmark. Econometrica 79, 651-692

Mittone, L., 2006. Dynamic behaviour in tax evasion: An experimental approach. Journal of Socio-Economics 35, 813-835

Schwartz, R.D., Orleans, S., 1967. On legal sanctions. The University of Chicago Law Review 34, 274-300

Selmrod, J., Blumenthal, M., Christian, C., 2001. Taxpayer response to an increased probability of audit: Evidence from a controlled experiment in Minnesota. Journal of Public Economics 79, 455-483

Slemrod, J., Blumenthal, M., Christian, C., 2001. Taxpayer response to an increased probability of audit: Evidence from a controlled experiment in Minnesota. Journal of Public Economics 79, 455-483

Srinivasan, T.N., 1973. Tax evasion: A model. Journal of Public Economics 2, 339-346
Torgler, B., 2002. Speaking to theorists and searching for facts: Tax morale and tax compliance in experiments. Journal of Economic Surveys 16, 657-683
Torgler, B., 2004. Moral suasion: An alternative tax policy strategy? Evidence from a controlled field experiment in Switzerland. Economics of Governance 5
Torgler, B., 2007. Tax compliance and tax morale: A theoretical and empirical analysis. Edward Elgar, Cheltham, UK.