Measuring the Impact of Tax Inspection on Firms' Performance

Muhamad Taufan Setiawan

Abstract

The tax compliance problem is an imminent issue in a self-assessment taxation system in Indonesia. Tax audit is an important tool used by the tax authority to address the problem. Several studies showed that tax inspection might change the behaviour of the taxpayers. Therefore, it is interesting to see how tax inspection will affect taxpayers' behaviour related to their subjective measure of firms' performance. This research uses the difference-in-difference approach combine with the entropy balancing method to estimate the causal impact of tax inspection on firms' performance. The findings indicated that the inspected firms showed an increase in their perception of capital utilization which can be explained using tax evasion model or managerial benefits concept.

Keywords: Tax compliance; Tax inspection; firms' performance; managerial benefit, entropy balancing.

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I.   Introduction

1.1. Background of problems

Indonesia uses a self-assessment method for corporate income tax. The taxpayer will be obliged to calculate, pay and report their liabilities according to current tax law. To control the taxpayer's compliance, the Directorate General of Taxes (DGT) conducts tax inspections based on some criteria to check the taxpayer's compliance.

The requirements or indication of non-compliance which the DGT uses to determine audit targets are their tax files return, tax inspection status in the last three years, financial report analysis, and other observation. When the tax audit complete, the DGT will issue a tax assessment and tax collection letter contained the findings and sanctions as a reference and legal document to collect the remaining liabilities of the taxpayers.

1.2. The problems

In Indonesia, tax revenue contributed more than 70% of the national budget. However, the tax ratios are still considerably low, around 10%, from 2014 to 2019 (World Bank, 2021). This tax ratio level suggests that there is severe tax compliance problem in Indonesia. One of the efforts to control compliance level is through tax audit or inspection. Tax inspection is a tool for the government to address the non-compliance behavior of the taxpayer. The OECD (2006, p. 9) defines "A tax audit is an examination of whether a taxpayer has correctly assessed and reported their tax liability and fulfilled other obligations."

Table 1. Formal Compliance ratio in Indonesia

Year	Corporate and non-employee individual taxpayer
2017	62.89%
2018	59.57%
2019	62.08%

Source: Internal Report DGT (2019)

The tax compliance problem is an imminent issue in a self-assessment taxation system. In Indonesia, from the Directorate General of Taxes (DGT) annual report, the percentage of the taxpayer who reported their tax return in 2017 is 62.89%. The number went down to 59.57% in 2018 but increase again in 2019 to 52.08%.

Table 2. Audit Coverage Ratio in Indonesia

Year	Corporate	Individual
2016	2.00%	0.36%
2017	2.87%	0.45%
2018	3.23%	0.62%

Source: Internal Report DGT (2018)

The audit coverage ratios (ACR) in Indonesia are also considerably low. In 2016, DGT reported that the ratio is 2% for the corporate taxpayer. This number increase to 2.87% and 3.23% in 2017 and 2018, respectively. For individual taxpayers, the ratio was around

0.36% in 2016. Although this ratio has been steadily increasing to 0.45% and 0.62% in 2017 and 2018, the number is still low. From the data, we can see that DGT acknowledges tax inspection's importance and make an effort to improve the ratio.

Due to the vital role of tax inspection in the taxation system, it is essential to regularly assess how tax inspection impacts taxpayer behavior using different datasets and from different perspectives. Therefore, this research aims to find the causal impact of tax inspection on subjective firms' performance in Indonesia.

1.3. Logical Framework

Allingham and Sandmo's research in 1972 is one of the most cited literature in tax evasion topic. They analyzed taxpayer's efforts and decisions to evade taxes by underreporting their report. They also argued that tax reporting is a decision taken under uncertainty. When they disclosed less than their actual income, the payoff will depend on whether they get investigated. In that tax evasion model, they stated that if the individual knew that his past would be investigated when his evasion was observed, he would declare everything. (1972, p.337).

Moreover, there are several other studies about the impact of tax audits on taxpayer behavior, especially on their financial reporting activity. Debacker et al. (2018, p. 32) concluded that an inspection of randomly chosen individual taxpayers positively affects reported income by approximately 2.9 percent, and the impact lasts for six years after the audit. Slemrod et al. (2001, p. 482) differentiate the results of a randomized controlled experiment based on taxpayer income. It turns out that low and middle-income taxpayers who received a letter promising a specific audit showed an increasing income than those who did not receive such a letter.

Tax audit is costly for the firms. Bachas et al. (2018, p. 35) argue that tax inspection is one of the size-dependent tax enforcements. They tried to remove this particular policy from the equation using the general equilibrium model, and the result showed total factor productivity increase up to 0.8 percentage. Moreover, according to Ratto et al. (2013, p. 12), when the taxpayer's possibility of getting inspected increases, so does the expected deterrence effect. The direct impact may include a substantial fine and physical cost, and the indirect impact will cost them their reputation. Research from Ali (2018, p. 27) indicates tax administration increase the compliance cost more than other regulations.

Previous literature also discussed managerial benefits of being included in tax compliance activities despite the cost of tax compliance. Tran-Nam (2000, p.232) mentioned benefits that can improve business and individual decision-making related to tax compliance. He stated that "These can be brought about by the need to have stringent record keeping in order to comply with the requirements of the tax laws." Lignier (2009, p.33) also stated that "The evidence collected during this research suggests that as a consequence of tax compliance requirements, Tax Complying Entities (TCE) will keep their records more accurate and more up-to-date." He also mentioned that these managerial benefits for the firms would offset the compliance cost that occurred if they use the improved information from the record-keeping system accordingly.

In this research, I use the difference-in-difference approach and use the World Bank Enterprises Surveys dataset. One of the findings suggests that inspected firms tend to

answer the subjective capital utilization question with a higher value than uninspected firms. The finding's relevance with previous literature is discussed in the results section.

II.   Data and Methodology

2.1. Data

This research uses Indonesian firms' data set from the Enterprise Surveys, which the World Bank conducts. It is an ongoing project by the World Bank to capture business environment data from firms' perceptions. In Indonesia, the region captured by this survey is West Java, East Java, DKI Jakarta, Banten, Centre Java, South Sulawesi, North Sumatra, Bali, and Lampung. The data set consists of two periods of data, 2009 and 2015.

The dependent variable in this research is the subjective measure of firms' performance. The proxy that was used to explain this is the answer to question F1 in the survey. The question is, "In the last fiscal year, what was this establishment's output produced as a proportion of the maximum output possible if using all the resources available (capacity utilization)?". The criterion of this variable falls to the subjective measure of organization performance. According to Singh et al. (2015, p. 221), "… researchers have often successfully resorted to subjective assessment of objective performance measures to assess the organization performance of companies in their research." From their research, they concluded that subjective measures are valid and reliable. In addition, Vij and Bedi (2016, p.9-10), "The study finds a high degree of positive correlation between subjective business performance and objective business performance. … and may be recommended in situation warranted by non-availability of archival data." However, it is important to admit that objective measure data would be preferable to the subjective one, especially when access to the data is available.

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Capacity Utilization	638	65.381	41.499	0	100
Tax Inspection	638	0.129	0.335	0	1
Log of sales	597	21.158	2.711	14.078	30.561
Firms with external audit	638	0.154	0.361	0	1
Access to finance	638	0.676	0.469	0	1
Time deals with govt. issue	598	3.498	11.323	0	100
Firms with government contract	636	0.060	0.237	0	1
Total labour	638	110.450	353.032	2	4325

Source: Stata output, Author.

The treatment of interest is whether firms get inspected or not in the last period. Covariates on this model consist of six variables: log of total annual sales, firms with external audit, access to finance, government-dealing time, firms with a government contract, and the number of labor. The covariates selection is based on the availability of data that might influence the firms' capital utilization.

The total observations from this data set are 319 firms in each period. The dependent variable measurement unit is a percentage, range from zero to 100 percent. The mean of the outcome variable is around 65.38 percent. Because this research uses the difference in difference method, they will be divided into control and treatment groups. The

control group consists of 237 firms that are not inspected in both periods, where the treatment group consists of 82 firms that get audited in the second period of observation.

Table 4. Tabulation of year treated

Year of survey	Inspected		
	No	Yes	Total
2009	319	0	319
2015	237	82	319
Total	556	82	638

Source: Stata output, Author.

2.2. Methodology

This research uses a panel data fixed-effects difference in difference model (DID) with two periods of data, 2009 when the firm is not inspected and 2015, where it is inspected.

$$Y_{it} = \alpha + \tau T_{it} + \beta X_{it} + \eta_i + t_t + \varepsilon_{it} \qquad (1)$$

The outcome of interest or dependent variable is firms' performance, represented by Y, and subscripts i and t represent the individual firm and period. T is a dummy variable with the value of one when the firm is getting inspected at all periods; otherwise, it is zero. X is a set of covariates used in this model. Covariates are used to reduce the standard errors associated with the treatment effects. τ is the treatment effect of interest from this model; α, β, η, t are parameters to be estimated, and ε is the standard error.

Using DID, the data is divided into two groups, the control group and the treatment group. The treatment effect is measured by comparing the treatment group outcomes, before and after the treatment, with the control group's outcomes, which did not receive the treatment. From differencing the two outcomes, we can get tax inspection's impact on firms' performance.

Moreover, DID model is known for its parallel trend assumption. This assumption states that the treatment and control groups will have the same trend in the absence of treatment. In this model, the treatment effect is the difference in treatment outcomes, before and after the treatment, minus the difference in outcomes of the control group, before and after the treatment. The treatment effect is explained by the term Average Treatment Effect on the Treated (ATT) under the assumption (Callaway and Sant'Anna, 2020). The ATT is the average of difference between the potential outcome between treated and untreated group, which is mainly described with this equation:

$$ATT = E[Y_t(1) - Y_t(0)|T = 1] \qquad (2)$$

The parallel trend assumption means that the path of outcome for the treated group, in the absence of treatment, is parallel with the path of the untreated group. This assumption is helpful as the treatment group's outcome in the absence of treatment is not known or counterfactual. The parallel trend assumption equation is described with this equation:

$$E[Y_t(0) - Y_{t-1}(0)|T = 1] = E[Y_t(0) - Y_{t-1}|T = 0] \qquad (3)$$

Therefore, the ATT under the assumption is identified by:

$$ATT = E[Y_t - Y_{t-1}|T = 1] - E[Y_t - Y_{t-1}|T = 0] \qquad (4)$$

Khandker et al. (2010, p.71) argued that estimator in difference-in-difference tolerates the unobserved heterogeneity, which can inflict selection bias. However, this

approach will assume this unobserved heterogeneity as time-invariant. Therefore, the differencing process will eliminate the bias if the parallel trend assumption holds.

He also mentioned that difference in difference method could be interpreted correctly when the error term is uncorrelated with other variables in the estimation equation, or:

$$cov(\varepsilon_{it}, T_{it}) = 0 \qquad (5)$$

When this underlying assumption is satisfied, then the treatment in this approach is as good as random because it relaxes the assumption of unconfoundedness. As my data set only contains two observation periods, I test the covariate balance as a quasi-test of the parallel trend assumption.

Last, the robustness check will be run between firms' locations, whether they are located in java island or outside, to gain more information about the effects on each subgroup.

III. Results, Analysis, and Discussions

3.1. Regression Results

From the result, under the diff-in-diff approach, tax inspection will increase the firm's subjective measure of their performance by 17.345 percent. This result is significant at ten percent level. This positive impact of tax inspection on firms' performance could be caused by firms changing their tax evasion behaviour under the treatment and subjectively altering their perception of capital utilization.

This result showed a relevant connection with Allingham and Sandmo tax evasion model (1972, p.337). They argue that "if the individual knows that once he is discovered his whole past will be investigated, his behaviour is straightforward: he will act exactly as he would … and thereafter declare everything." When the firms are subject to a tax investigation, they tend to change their behaviour and report everything which previously undisclosed. This behaviour is reflected in their subjective measure of capital utilization. However, subjective capital utilization cannot be translated directly as tax compliance measurement. It can only suggest that there is a change in behaviour between firms who get treated and the firms in the untreated group.

The increase in that subjective valuation of firms' performance can also be caused by managerial benefits from tax compliance, as discussed by a study from Lignier in 2009. He argued that the perceived value of accounting information is correlated with the managerial benefits from tax compliance. In other words, tax compliance activities by the firms improved their record-keeping details and decision-making (Lignier 2006, p.141). Thus, with a more detailed accounting record, firms can operate their business more efficiently. Moreover, it is also possible that firms perceived their increase in capital utilization based on their growth in sales or other accounting information related to performance.

Table 5. Regression Results

Variables	(1)	(2)	(3)	(4)	(7)	(5)	(6)	(8)
	FE DID		Java			Non-Java		

	without weights	with weights/ entropy balancing	without weights	entropy balancing	with separate weighting process	without weights	entropy balancing	with separate weighting process
treated	4.344	**17.345***	1.891	**20.488***	**18.762**	3.049	**-7.233**	**-6.065**
	(5.310)	(10.483)	(6.067)	(12.299)	(12.388)	(10.640)	(11.922)	(8.094)
lsales	0.310	-2.438	0.475	-3.098*	-2.992	-2.220	-0.063	
	(0.991)	(1.522)	(1.039)	(1.789)	(1.870)	(3.360)	(1.218)	
extaudit	-10.350*	-3.297	-7.146	-0.427	2.521	-20.968	-13.627	0.735
	(5.796)	(8.021)	(7.400)	(11.380)	(12.024)	(12.704)	(13.595)	(3.844)
finan	-1.090	-15.287**	-4.708	-15.224**	-15.881**	11.717	1.573	1.471
	(3.853)	(6.524)	(4.320)	(6.331)	(6.979)	(9.334)	(11.602)	(11.185)
govtime	0.206	0.076	0.227	0.070	0.437	-0.193	-0.135	
	(0.179)	(0.297)	(0.197)	(0.333)	(0.384)	(0.164)	(0.206)	
procgov	-25.545**	32.168	-32.254*	31.199	28.291	-9.675	-0.085	2.531
	(12.894)	(21.127)	(16.565)	(21.920)	(23.784)	(12.062)	(10.670)	(6.470)
labor	0.013	-0.010	0.013	-0.006	-0.003	0.375**	0.191	0.111
	(0.012)	(0.025)	(0.012)	(0.025)	(0.023)	(0.178)	(0.217)	(0.346)
2015.year	-2.077	-12.262**	-4.111	-16.214***	-15.057**	6.071	15.415	3.533
	(2.865)	(5.703)	(3.077)	(6.117)	(6.535)	(8.221)	(9.208)	(6.138)
Constant	61.824***	132.285***	61.797***	148.334***	142.883***	93.836	53.692	57.187***
	(20.624)	(40.269)	(21.968)	(45.933)	(47.773)	(65.194)	(34.141)	(19.151)
Obs	567	567	456	456	456	111	111	125
R-squared	0.846	0.918	0.844	0.911	0.899	0.889	0.984	0.999

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Note:

(1) panel data diff-in-diff regression, without balancing.

(2) panel data diff-in-diff regression with weights from entropy balancing

(3) panel data diff-in-diff regression, without balancing, for firms in Java Island

(4) panel data diff-in-diff regression, same weights as (2), for firms in Java Island

(5) panel data diff-in-diff regression, new weights, for firms in Java Island

(6) panel data diff-in-diff regression, without balancing, for firms outside Java Island

(7) panel data diff-in-diff regression, same weights as (2), for firms outside Java Island

(8) panel data diff-in-diff regression, new weights, for firms outside Java Island

Source: Stata output, Author.

3.2. Robustness Test

The primary assumption for the difference-in-difference approach is the parallel trend assumption. In this dataset, I only have two periods of data, 2009 and 2015. Therefore, the covariates need to balance around the treatment as it is a quasi-test of the parallel trends and the "as good as random" assumption. First, I run the simple regression between the treated variable and each covariate. The initial findings show that at least three covariates are not

balanced (log of sales, external audit, and total labor). Thus, I implement the entropy balancing method using *ebalance* package in Stata from Hainmueller and Xu (2013, p. 16). They argued that "The method allows researchers to create balanced samples for observational studies with binary treatments or to reweight a dataset to some known target moments." They also mentioned that the method could also be used in combination with regression by using the weights from covariate adjusting process and applying it to the model. Moreover, he stated, "the balance improvement result from entropy balancing can translate into lower approximation error and reduced model dependency in finite samples" (Hainmueller 2012, p.44).

In his previous literature about entropy balancing, Hainmueller (*ibid*) explained that this pre-processing method's objective is to generate a well-balanced sample by adjusting the unit weights to the specified sample moments. To retain the information in the variables, he mentioned that the process "… moving the weights as little as possible to retain information … and obviates the need for continual balance checking for the moments that are included in the reweighting."

After the reweighting process using the entropy balance approach, I rerun the simple regression using the new weights. The result indicated that all the covariates now balance around the treatment. As mentioned earlier, the weights can be used with another estimator. Thus, I use these weights with panel data diff-in-diff to estimate the treatment effect, and the result I wrote in the previous section is acquired using this process.

In robustness check, I divided the firm's location with dummy variables that separate firms in Java Island from firms outside Java Island and regress it using weights from the initial model. The result from this approach, for the Java group, is similar to the main model. The coefficient increases to 20.48% and significant at 10% level (p-value = 0.097). However, for the non-Java group, the result is insignificant, with a different sign of coefficient (-7.23), suggesting that the impact of tax inspection is no different from zero. The regression output without using the entropy balancing approach was also presented to see how the weights affect the results.

To check it further, I reweight the variables between the Java and non-Java groups, using the entropy balancing method separately. Notice in the table that for the non-Java group, I use fewer covariates since the log of sales and time-spent for government variables cannot be reweighted using the balancing method, which is probably caused by the insufficient number of observations. The results are slightly different compared to the previous group. For the Java group, the impact no longer significant at 10% level because the p-value change to 0.132. For the non-Java group, the effect is still insignificant with -6.065 coefficient value.

In robustness check, the result showed a similar effect for the firms located in java island but showed a nonsignificant effect on the firms outside java island. This result could suggest different behaviour of firms between the Java and non-Java groups. The firms who reside in Java Island might increase their subjective performance measure while firms outside Java Island behaviour are unaffected by the treatment. In Indonesia, tax audit might focus heavily on java island as it is the centre of economic activities. In 2018, the contribution of Java Island to Indonesian GDP was 58.48% (Tempo, 2021). In addition, research that studied the difference in compliance level between locations suggest that "people who live in

large urban areas were significantly less likely to be non-compliant compared with those in rural areas or a village." (Williams 2020, p.7)

IV. Conclussion

To conclude, from the main result, I argue that tax inspection positively impacts a firm's performance, and the impact is significant at 10% level. Firms that get inspected have an increase in their capital utilization by 17% compared with those not treated. Two things might explain this behaviour change. First, it can be explained by the tax evasion model from Allingham and Sandmo (1972, p. 337), where the taxpayer tends to reveal everything once they know that they are being investigated by the tax authority. Another explanation might relate to managerial benefits gained from tax complying activities. In Lignier's (2006, p.141) research, tax compliance activities can lead to more detailed record keeping and improved decision-making. These benefits could make firms to be more efficient and increase their performance.

However, considering tax inspection nature as a government check and balance tool, the estimated effect might not be caused solely by the inspection. The number showed might result from the firm's awareness of being monitored by the government or the Hawthorne Effect. Besides that, another limitation of this research lies in the gap between the two periods. There is a probability for firms to get inspected more than once by the tax authority in those gap years. The number of observations in the dataset is relatively small. Thus, before generalizing the results, further research in the related topic is strongly encouraged. In addition, it would be good to see the result of research on this topic using the objective measure data if access to the data is available.

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