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Abstract: Third-party auditors are usually chosen and paid by the agent that is being audited and this may lead to a significant conflict of interest and to less strict audits. We investigate the effect of a new random allocation mechanism, according to which, starting from 2012, auditors of Italian municipalities have had to be chosen by means of a random draw from a large pool of experts. By exploiting the staggered adoption of the new allocation rule across municipalities, our difference-in-differences estimates show that the new regime implies a worsening of municipalities' reported public finances, in terms of budget surpluses of the probability to be in financial distress. The effect is largely driven from municipalities endowed with lower social capital, so signalling that random allocation is somehow a substitute for the solution of the conflict of interest problem. In these municipalities, we also find that the new mechanism reduces some fraud detection indicators based on Benford's law.

JEL codes: M42, H72, D82

Keywords: Third-party auditors, random selection mechanism, public finance truthfulness.

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1. Introduction

Third-party audits are used in many settings to credibly certify information provided by economic agents; notable examples include financial accounting, credit ratings, quality assessments and food quality (Duflo et al. 2013). In most, if not all cases, auditors are chosen and paid by the actor that is being audited. This may lead to a significant conflict of interest, as the payment received by the auditor and the likelihood of being selected again in the future are likely to conflict with the truthfulness of data auditing (Ronen, 2010; White, 2010). Therefore, in a set-up where auditing is the norm, does the method of auditors' selection matter? More precisely, what happens when third-party auditors are randomly selected, rather than chosen by the actor that is audited?

The aim of this paper is to explore this research question. We investigate the effect of a *random auditor selection*, drawing evidence from a reform introduced in Italy in 2011 (*Law 148/2011*). Before the introduction of this law, local governments could choose their own auditor and were given the possibility of auditors' reappointment. According to the reform, auditors of local governments are to be chosen by means of a random draw from a large pool of experts. Indeed, the aim of this paper is to assess whether the introduction of a random selection of auditors has an impact on a number of key local government finance indicators. Our units of analysis are over 8,000 municipalities in a developed country (Italy), which presents significant geographical disparities in terms of economic development, social norms and institutions. As a second step in our analysis, we explore the effect of random auditor selection on data truthfulness and budgetary fraud. Crucially for identification purposes, the new mechanism was implemented in a staggered and random fashion across Italian municipalities, as the reform was implemented starting from the next auditor's appointment.

The first immediate effect of the reform was to drastically reduce the probability of auditors' reappointment in the same municipality: prior to the reform, 57% of auditors are reappointed by the same municipality. After the introduction of the random auditor selection, the probability of reappointment drops to almost zero (0.3%). The change in auditors' selection process allows us to analyse the extent of auditors' conflict of interest. Indeed, we are able to test whether random selection increases auditor's independence, by eliminating the incentives to be prone to a local government's pressure. In the first instance, we investigate the effect of random auditor selection on three main measures of the soundness of local administration's financial statements, namely debt unsustainability, budget surplus per capita, and an indicator of municipalities' financial distress. The empirical evidence shows a worsening of

municipalities' reported public finances under the new regimes, as budget surpluses decrease under the new reform and treated municipalities are more likely to be in financial distress. We interpret these findings as evidence in support of the random selection process reducing auditors' conflict of interest in reporting and auditing. In particular, we provide evidence that the negative effect of the reform on municipalities' finances is mainly driven by municipalities in the South of Italy. We further explore the potential mechanism at play. Before the reform, auditors might have faced a conflict of interest between the probability of reappointment and truthfulness in their data reporting. This conflict of interest may have led auditors selected according to the old regime to engage in data falsification. To this end, we investigate the effect of the reform on data truthfulness, measured on the basis of Benford's law (Rauch et al. 2011). Benford's law predicts the distribution of first digit numbers of naturally arising (*i.e.* not manipulated) numbers. We construct two main indices based on Benford's law, which capture the distance between the theoretical and empirical distributions of the first digits of municipalities' financial statement items (Rauch et al. 2011, Demir and Javorcik, forthcoming). The distance between the two distributions can be interpreted as an indicator of budgetary fraud. We find no effect of random auditor selection on these measures of data manipulations when the entire sample is considered. However, a very different picture emerges when we restrict the sample to Central-Southern municipalities: the reform reduces our measures of data falsification in treated municipalities in the Centre-South of Italy. The worsening of reported local public finances can be attributed to the more accurate data reporting: we conclude that the reform is effective in reducing auditors' conflict of interest in data reporting.

Our study complements the established literature analysing the effect of random audits: electoral accountability (Ferraz and Finan, 2008), corruption practices (Ferraz and Finan, 2011), the non-electoral cost of engaging in corruption (Avis et al. 2018), rent extraction (Zamboni and Litschig, 2018), and the timing of disseminating audit results (Bobonis et al, 2016). Most of these studies investigate the effects of random audits and how agents respond to the increased probability of being audited. Instead, the aim of this paper is to explore the effect of *randomly choosing* auditors, holding constant the auditing process. This paper provides evidence that even when audits are in place, the selection of auditors is crucial in affecting auditors' conflict of interest and data truthfulness. To the best of our knowledge, the only paper in the literature that tackles the issue of random auditor selection is the work by Duflo et al. (2013), based on a two-year field experiment conducted in Gujarat across over 400 polluting firms. Their experiment involves the random assignment of auditors to the plant, the payment to auditors from a central pool and at a fixed rate, subsequent back-checks and a direct

incentive pay for auditor accuracy. Duflo et al. (2013) provide evidence of a largely corrupted status quo, whereby auditors routinely underreported the extent of pollution emissions. Auditors in treated plants are found to report higher pollution readings and they are more likely to report emissions truthfully. Overall, the treatment led firms to reduce their emissions, as government authorities would receive more reliable audit reports. As acknowledged by the authors, it is not possible to disentangle which aspect of the treatment led to such a change, whether it was the random assignment, the central payment, or the fixed rate. Our study departs from Duflo et al. (2013) in two ways. Firstly, we focus on audits of public sector accounting rather than environmental audits. Secondly, we study the working of a brand-new allocation system instead of detecting corrupt behaviours within an existing audit system. In fact, the quasi-random framework enables us to isolate the effect of random selection and directly test concerns relating to an auditor's conflict of interest. The findings of this paper are of paramount importance in terms of policy implications and the design of audit reforms. To the best of our knowledge, our study is the first that focuses on the introduction of a new policy that allows external auditors for local governments to be selected by mean of a random draw from a pool of auditors.

The paper proceeds as follows: Section 2 describes the institutional setting, while Section 3 presents the identification strategy and the data. Section 4 presents the empirical results, while Section 5 discusses robustness checks. In Section 6, we look at the role of budgetary fraud and Section 7 concludes.

2. Institutional background

The Italian legal system attributes the auditing of municipal financial accounts to 1 or 3 auditors, depending on whether the population of the municipality is lower or higher than 15,000 inhabitants.¹ Auditors hold office for 3 years, and their main remit is to supervise the accounting and the financial and economic regularity of the city council's management. The audit body is responsible (jointly with the municipality's governing body) for the truthfulness of the city council's balance sheets. In terms of the timing of audits, balance sheets of any one year are approved on April of the following year. If the audit ascertains serious administrative irregularities, the auditor reports the irregularities to the municipal council and, in the most

¹ This subject is regulated by the Legislative Decree no. 267/2000 stating rules governing local authorities (Provinces, Municipalities, Unions of Municipalities and Mountain Communities). This paper looks only at municipalities whose auditors are appointed at the municipal level and not at the union or community level.

serious cases, to the judiciary system. In order to fulfil its tasks, the audit body has access to the proceedings and documents of a municipality and its members can carry out inspections and individual controls. The audit body also draws up an annual report on the final statement of revenues and expenditures, stating its correspondence to the accounting records and including proposals for improving management efficiency. Auditors are required to be listed in the Register of Auditors and the Register of Chartered Accountants and Accounting Experts. In the Registers, auditors are divided according to their region of residence and the categories of local administrations they can audit, as higher experience is required for larger municipalities.² Before the introduction of the reform (*Law 148/2011*) auditors were selected and appointed directly by the municipal council among those on the register. More importantly, municipal councils could reappoint the same auditing body more than once: according to our calculations based on data available from the Ministry of Interior, the probability of reappointment was 56.6% before the reform.³ In 2011, the reform, was passed, according to which external auditors for local governments are to be chosen by means of a random draw from a list of auditors at the regional level. The actual draws take place at the local authority under the Ministry of the Interior (“Prefecture”), which then assigns the selected auditors to municipalities.⁴ According to Law 148/2011, municipalities give notice of the expiry date of their audit body to the Prefecture at least 2 months in advance. After that, the Prefecture sets the date for the random draw, which takes place in the presence of the Prefect or a delegate. On the appointed day and in a public session, the names of the members of the audit bodies to be renewed are randomly drawn through a computerized system. For each auditor to be renewed, three names are drawn, the first of which is designated for the appointment. If he or she turns down the nomination or there are impediments to their appointment, they are replaced by the others according to the order of the draw.⁵

Crucially to our analysis, the new mechanism is implemented starting from the next auditor body’s appointment. Figure 1 presents the staggered nature of the introduction of Law 148, whereby, depending on the random timing of the expiration of an audit body’s appointment, municipalities implement the reform at different time periods. The implementation decree was ratified in the first months of 2012 and the first random draw took

² The list is publicly available on the Ministry of the Interior’s website (<https://dait.interno.gov.it/finanza-locale/revisori-enti-locali>)

³ <https://dait.interno.gov.it/finanza-locale/revisori-enti-locali>

⁴ Italian Prefectures are local authorities under the Ministry of the Interior set at the provincial level.

⁵ While Law 148/2011 applies to all local governments, *i.e.* at region, province and municipality level, we only focus on municipalities, as this would allow us to have a greater geographical variation, as well as a larger sample size.

place in December 2012, therefore, the first balance sheet under the new regime was approved in 2013. As presented in Figure 1, not all municipalities were treated. Indeed, Law 148/2011 only applies to the local administrations of the Regions with ordinary statute. Five of the 20 Italian regions have a Special Statute and they have discretion on the implementation of Italian regulations related to local authorities.⁶ Two of the 5 regions with a Special Statute (Sardinia and Friuli Venezia Giulia) implemented the reform in 2017, which falls outside the sample employed in the analysis and are therefore considered as control throughout the analysis.

Figure 1: Implementation of Law 148/2011

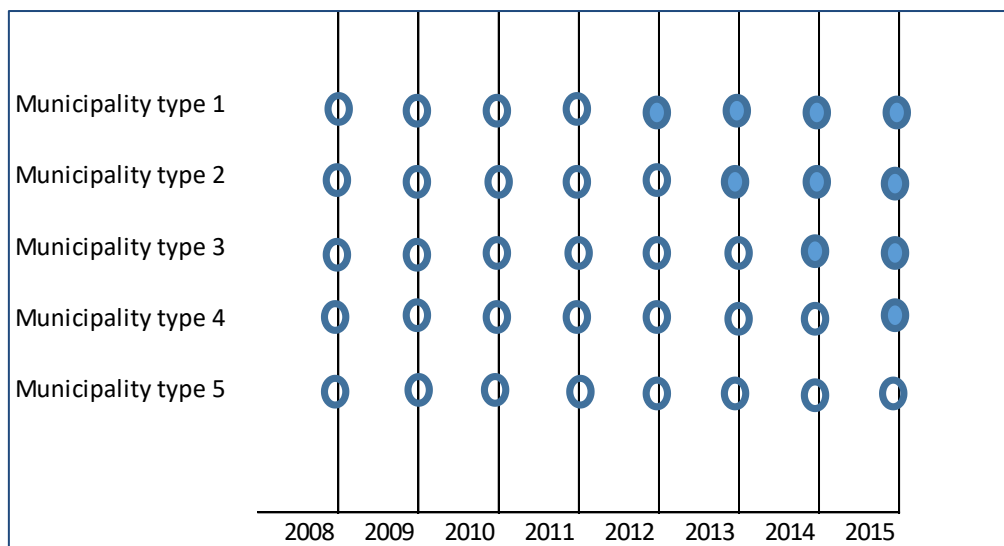


Table A1 in the Online Appendix presents the timing of Law 148/2011’s implementation. The first draws were conducted in December 2012, 4 months ahead of the balance sheet approval. Subsequent draws were conducted on the basis of the random timing of the expiration of an audit body’s appointment. Importantly for our analysis, the probability of being reappointed by the same municipality drastically drops after the introduction of the reform: according to our calculations, only 0.3% of auditors are re-appointed by the same municipality council after Law 148/2011 (57% under the old regime).

3. Identification strategy and data

Econometric specification

⁶ The 5 Special Statute Regions are Sicily, Sardinia, Friulia Venezia Giulia, Valle d’Aosta and Trentino Alto Adige.

We leverage the staggered random adoption of the new rule across municipalities by means of a difference-in-differences identification design. To test the effect of the random auditor selection on municipalities' public finances, we estimate the following specification:

$$y_{mt} = \alpha + \beta TREAT_{mt} + \gamma_t + \delta_m + \theta Z_{mt} + \varepsilon_{mt}$$

where y_{mt} is one of the outcome variables of municipality m in year t . In first instance, we consider a set of three variables used by the Italian Court of Audit to assess the soundness of local administration's financial statements, namely (i) debt unsustainability, measured as the ratio between the expenditure for passive interests and current revenues; (ii) budget surplus per capita, measured as a difference between current and capital revenues and current and capital expenditures divided by population; and (iii) an indicator of municipalities' financial distress. The variable $TREAT_{mt}$ is equal to 1 if the balance sheet is under the new regime and 0 otherwise. In any specification we control for municipalities fixed effects, δ_m , time fixed effects, γ_t , and a set of time-varying control variables at municipality level, Z_{mt} , which includes dummies for city size and for being located in the Centre-South of Italy, interacted with a time trend. Standard errors are clustered at the municipality level.

Data

The main source of data is the Ministry of the Interior, where municipalities' balance sheets and the information on the public draw calendar are made publicly available. On the basis of these data, we construct a panel dataset from 2008 to 2015, at municipality level. As described in the previous section, we consider three variables capturing the soundness of the local administration's financial statements. These three measures are used by the Italian Court of Audit to assess the soundness of local governments' public finances. The first variable is related to debt. Namely, we focus on debt unsustainability, measured as the ratio between expenditure for passive interests and current revenues. This measure can be considered as the corresponding debt-to-GDP ratio evaluated at municipality level. Our second outcome variable is budget surplus per capita, measured as the difference between current and capital revenues and current and capital expenditures divided by municipality population. This indicator mirrors the deficit-to-GDP ratio at the local level. Finally, we look at an index of municipalities' financial distress. The first two dependent variables are intended to capture the economic "sense" of sound local public finance. The third dependent variable complements the first two

by looking at a legal operationalization of soundness. According to the Italian law, a municipality has a “*structural deficit*” (*i.e.* an unsound situation) if it does not meet 5 out of 10 criteria (4 out of 8 until 2008). Under the “structural deficit” condition, a municipality may raise local taxes, becomes more strictly monitored by the central government and partially loses its spending independence.⁷ Hence, our third dependent variable – an index of official financial distress – is the share of criteria that the municipality does not meet. Table 1 present the summary statistics of the three measures.

Table 1: Summary statistics

| | Mean | SD | Min | Max | n |
|--------------------------|-----------|--------|-----------|-----------|--------|
| Debt unsustainability | 0.043 | 0.027 | 0 | 0.9085 | 62,866 |
| Budget Surplus pc | 22.46 | 631.63 | -21,277.2 | 51,626.05 | 63,674 |
| Financial distress index | 0.118 | 0.125 | 0 | 0.75 | 63,723 |
| Population | 7,408.696 | 40,634 | 31 | 2,872,021 | 63,674 |
| Centre-South Indicator | 0.438 | .496 | 0 | 1 | 63,723 |
| Treat4 | 0.188 | 0.391 | 0 | 1 | 63,723 |
| Treat6 | 0.163 | 0.369 | 0 | 1 | 63,723 |
| Treat8 | 0.145 | 0.352 | 0 | 1 | 63,723 |
| Euclidean distance | 0.065 | 0.026 | 0.0109 | 0.332 | 63,723 |
| Distance-Demir Javorcik | 0.0053 | 0.0053 | 0.00012 | 0.11844 | 63,723 |

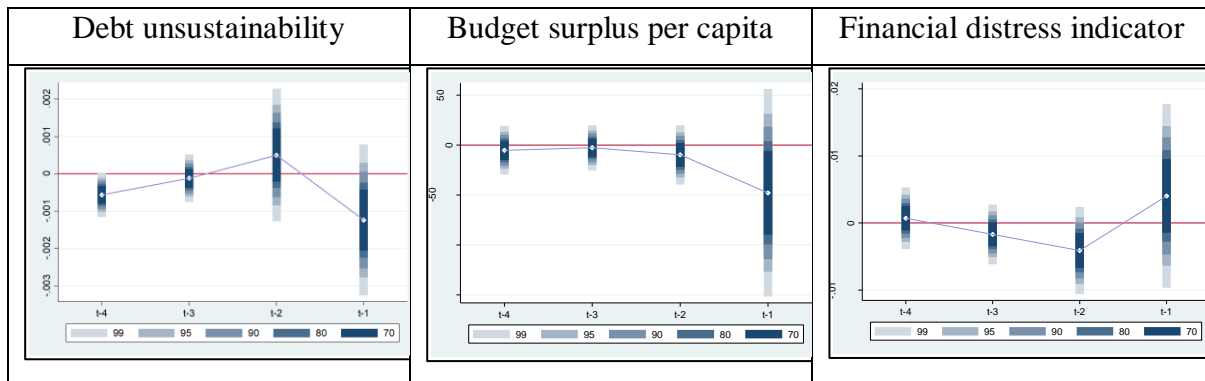
Municipalities under the new regime are classified as treated. Given the timing of budget approval, *i.e.* a balance sheet of year t is approved in April of the following year ($t+1$), we consider three measures of $TREAT_{mt}$ depending on the timing of the random draw, *i.e.* 4, 6 or 8 months before April. These three measures aim to capture the length of tenure of the audit body between the random draw and the approval of the balance sheet. The summary statistics of the three indicators are presented in Table 1: the three treatment indicator variables are equal to 1 if the balance sheet is under the new regime and 0 otherwise.

Before proceeding with presenting the estimation results, we present the evidence related to parallel trends, in light of the difference-in-differences approach implemented in the analysis. Figures 2 presents the parallel trends for the three main outcome of interest, whereby a municipality is considered treated if an auditor under the new regime has been in place for at least 4 months (Treat4).⁸ The parallel trends hypothesis is satisfied for each of the three measures of soundness of municipality finances.

⁷ Example of criteria include the existence of execution procedures, the existence of large credit left, etc.

⁸ Tables A1, A2, and A3 in the Appendix presents the parallel trends for Central-Southern municipalities only.

Figure 2: Parallel trends



4. Estimation results

What is the effect of random auditor selection on the soundness of local administrations' budgets? As detailed in the previous section, in the first instance we investigate the impact of the reform on three measures, namely debt unsustainability, budget surplus per capita, and an indicator of municipalities' financial distress.

Table 2 presents the results of the estimation where the dependent variable is the ratio between the expenditure for passive interests and current revenues, *i.e.* our measure of debt sustainability. In the first three columns, the treatment indicator (*Treat4*) takes the value 1 if the municipality budget is under the new regime and the auditor body has been in place for more than four months. The specification controls for municipality fixed effects, time dummies and the municipality size, as measured by population. We find no effect of the reform on debt unsustainability. We obtain similar results when we control for a centre-south trend (column 2) or when we restrict the sample by dropping the largest municipalities, *i.e.* we drop the top 1% according to population size (column 3). Similar results emerge also when we consider the other two measures of treatment, which capture auditors' lengths of tenure.

Table 2: Debt Unsustainability

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-------------------------|------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | <i>Debt unsustainability</i> | | | | | | | | |
| Treat4 | -0.0004 (0.0002) | -0.0002 (0.0002) | -0.0003 (0.0002) | | | | | | |
| Treat6 | | | | -0.0001 (0.0002) | -0.0001 (0.0002) | -0.0001 (0.0002) | | | |
| Treat8 | | | | | | | -0.0002 (0.0003) | -0.0002 (0.0002) | -0.0002 (0.0003) |
| Observations | 62,817 | 62,817 | 62,036 | 62,817 | 62,817 | 62,036 | 62,817 | 62,817 | 62,036 |
| Number of communes | 8,072 | 8,072 | 7,935 | 8,072 | 8,072 | 7,935 | 8,072 | 8,072 | 7,935 |
| Adjusted R2 | 0.116 | 0.128 | 0.119 | 0.116 | 0.128 | 0.119 | 0.116 | 0.128 | 0.119 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample | Full | Full | Restricted | Full | Full | Restricted | Full | Full | Restricted |
| Centre-South*year trend | No | Yes | No | No | Yes | No | No | Yes | No |

Notes. In all columns, the dependent variable is the ratio between the expenditure for passive interests and current revenues at municipality level. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Next, we consider the effect of the reform on budget surplus per capita, measured as the difference between current and capital revenues and current and capital expenditures divided by population. The effect of the random auditor selection is negative and statistically significant across the three measures of treatment, the inclusion of the Centre-south trend (column 2, 5, and 8) and the exclusion of the largest municipalities (column 3, 6 and 9). On average, the random auditor selection is associated with a worsening of reported budget surplus by 34-42 euro per capita.

As discussed in Section 3, according to Italian law, a municipality is classified having a structural deficit if it does not meet 5 out of 10 criteria (4 out of 8 until 2008) established by the Ministry of Interior. A municipality deemed in “structural deficit” becomes more strictly monitored by the central government and loses some of its autonomy in its spending decisions. Table 4 presents the results of the estimation where the dependent variable is an index of official financial distress, as measured by the share of criteria that the municipality does not meet. The estimation results confirm the previous findings: following the introduction of the random auditors’ selection, treated municipalities fail to meet a higher share of criteria of budget soundness.

Table 3: Budget Surplus per capita

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-------------------------|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | <i>Budget Surplus per capita</i> | | | | | | | | |
| Treat4 | -34.5*** (12.151) | -33.2*** (12.190) | -34.4*** (12.296) | | | | | | |
| Treat6 | | | | -42.4*** (13.700) | -42.2*** (13.709) | -41.9*** (13.882) | | | |
| Treat8 | | | | | | | -36.7*** (12.982) | -36.9*** (12.984) | -36.2*** (13.182) |
| Observations | 63,674 | 63,674 | 62,884 | 63,674 | 63,674 | 62,884 | 63,674 | 63,674 | 62,884 |
| Number of communes | 8,072 | 8,072 | 7,935 | 8,072 | 8,072 | 7,935 | 8,072 | 8,072 | 7,935 |
| Adjusted R2 | 0.021 | 0.021 | 0.021 | 0.021 | 0.021 | 0.021 | 0.021 | 0.021 | 0.021 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample | Full | Full | Restricted | Full | Full | Restricted | Full | Full | Restricted |
| Centre-South*year trend | No | Yes | No | No | Yes | No | No | Yes | No |

Notes. In all columns, the dependent variable is the difference between current and capital revenues and current and capital expenditures divided by population at municipality level. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

As in Table 3, this result is confirmed when using the three different measures of treatment, based on the lengths of tenure of auditors under the new regime, across the different specifications and the two different samples.

Table 4: Financial distress

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-------------------------|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | <i>Financial distress indicator</i> | | | | | | | | |
| Treat4 | 0.0065*** (0.0015) | 0.0067*** (0.0015) | 0.0067*** (0.0015) | | | | | | |
| Treat6 | | | | 0.0074*** (0.0016) | 0.0075*** (0.0016) | 0.0076*** (0.0016) | | | |
| Treat8 | | | | | | | 0.0080*** (0.0017) | 0.0080*** (0.0017) | 0.0083*** (0.0017) |
| Observations | 63,203 | 63,203 | 62,413 | 63,203 | 63,203 | 62,413 | 63,203 | 63,203 | 62,413 |
| Number of communes | 8,072 | 8,072 | 7,935 | 8,072 | 8,072 | 7,935 | 8,072 | 8,072 | 7,935 |
| Adjusted R2 | 0.036 | 0.037 | 0.037 | 0.036 | 0.037 | 0.037 | 0.037 | 0.037 | 0.037 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample | Full | Full | Restricted | Full | Full | Restricted | Full | Full | Restricted |
| Centre-South*year trend | No | Yes | No | No | Yes | No | No | Yes | No |

Notes. In all columns, the dependent variable is an index of official financial distress, discussed in Section 3. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Overall, the evidence presented in Tables 2, 3, and 4 shows that random auditor selection leads to a worsening of reported municipalities' public finances under the new regime. These

results are consistent with the findings by Duflo et al. (2013): the introduction of random selection may have reduced auditors' conflict of interest in reporting and auditing.

5. Robustness checks

Auditing body

As discussed in Section 2, the auditing body can consist of 1 or 3 auditors, depending on municipality size. Municipalities with a population lower than 15,000 inhabitants have one auditor, while the number of auditors goes up to 3 for municipalities with population above 15,000. It is important to highlight that the reform did not affect the number of auditors, but only their selection. Italian municipalities are largely small, indeed only 9% of municipalities have a population larger than 15,000 inhabitants. As a first robustness check, we replicate the previous analysis by restricting to larger municipalities only (above 15,000 inhabitants). The results, presented in Table 5 support the previous findings. We may conclude that even in the presence of an auditing body of three members, the random selection of auditors leads to a worsening of reported public finances in treated municipalities.

Table 5: Large municipalities (>15k inhabitants)

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|--------------------|------------------------------|-------------------------|------------------------|--------------------------|--------------------|-------------------|---------------------------|------------------------|-----------------------|
| | <i>Debt unsustainability</i> | | | <i>Budget Surplus pc</i> | | | <i>Financial distress</i> | | |
| Treat4 | -0.000160 (0.000563) | | | 35.54*** (12.55) | | | 0.0128** (0.00569) | | |
| Treat6 | | -0.000261 (0.000612) | | | 30.38** (13.48) | | | 0.0174*** (0.00601) | |
| Treat8 | | | 0.000338 (0.000630) | | | 22.58* (12.54) | | | 0.0145** (0.00591) |
| Observations | 5,629 | 5,629 | 5,629 | 5,721 | 5,721 | 5,721 | 5,711 | 5,711 | 5,711 |
| Number of communes | 746 | 746 | 746 | 746 | 746 | 746 | 746 | 746 | 746 |
| Adjusted R-squared | 0.266 | 0.266 | 0.266 | 0.116 | 0.115 | 0.114 | 0.025 | 0.026 | 0.026 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Notes. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Outliers

The public finance measures present large outliers, as shown in the summary statistics presented in Table 1. Table 6 reports the estimation results for the three dependent variables, once the top and bottom 1% values have been dropped. It is worth noting that the estimated

coefficients of the effect of the treatment on budget surplus per capita are smaller in magnitude than the ones reported in Table 3. Indeed, among the three measures of financial soundness, budget surplus per capita is the one that presents larger outliers (Table 1). However, the overall statistical significance of the coefficients is in line with the main specification presented in Tables 2-4.

Table 6: No outliers

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|--------------------|------------------------------|------------|------------|--------------------------|-----------|-----------|---------------------------|-----------|-----------|
| | <i>Debt unsustainability</i> | | | <i>Budget Surplus pc</i> | | | <i>Financial distress</i> | | |
| Treat4 | -0.000361* | | | -8.794* | | | 0.0104*** | | |
| | (0.000205) | | | (4.572) | | | (0.00173) | | |
| Treat6 | | -0.000145 | | | -14.59*** | | | 0.0107*** | |
| | | (0.000216) | | | (4.738) | | | (0.00182) | |
| Treat8 | | | -0.000267 | | | -15.39*** | | | 0.0105*** |
| | | | (0.000222) | | | (4.700) | | | (0.00184) |
| Observations | 61,565 | 61,565 | 61,565 | 62,406 | 62,406 | 62,406 | 33,046 | 33,046 | 33,046 |
| Number of communes | 8,049 | 8,049 | 8,049 | 8,069 | 8,069 | 8,069 | 7,167 | 7,167 | 7,167 |
| Adjusted R-squared | 0.170 | 0.170 | 0.170 | 0.063 | 0.063 | 0.063 | 0.038 | 0.038 | 0.038 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Notes. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Goodman Bacon decomposition

Our difference-in-differences approach relies on the staggered introduction of the reform across Italian municipalities. The two-way fixed effect difference-in-differences estimator that we have presented so far has a potential concern when treatment effects vary over time: in such a case, the estimator might be biased because earlier-treated units are used as controls (Goodman-Bacon, 2018). In order to assess whether this is the case in our setting, we perform the Goodman-Bacon (2018) decomposition, whose results are shown in Table 7.⁹ As to *Debt unsustainability*, the contribution coming from the ‘Timing groups’, which include the potential problematic use of early-adopters as controls, is never negligible so that we can not exclude that some bias is at work. In the case of *Budget Surplus pc*, the story is somehow different if treat6 or treat8 are the as treatment variable: in such cases, the (unbiased) contribution stemming from the ‘Never treated vs timing groups’ is much larger (from 5 to 9 times) than that arising from ‘Timing groups’ so that we are confident that the overall negative effect is not driven by the potential concern of the estimator. Moreover, in the case of Treat6

⁹ We use the STATA command `bacondecomp`, developed by Goodman-Bacon et al. (2018). The Goodman-Bacon decomposition is available only for balanced panel data sets, hence the decomposition presented below relies on the balanced panel dataset so that coefficients slightly differ from those presented in Tables 2-4.

and Treat8, the sign is the same so that the estimated parameter, if any is a lower bound. Conclusion are even neater for *Financial distress*. The unbiased component (‘Never treated vs timing groups?’) is much larger (9 to 14 times) than that referred to ‘Timing groups’ and the signs are always concordant.

Table 7: Goodman-Bacon decomposition

| | Treat4 | | | | | |
|--------------------------------|------------------------------|--------|--------------------------|--------|---------------------------|--------|
| | <i>Debt unsustainability</i> | | <i>Budget Surplus pc</i> | | <i>Financial distress</i> | |
| Coefficient (Std dev.) | -0.0003 (0.0002) | | -26.3934** (11.2966) | | 0.0102*** (0.0015) | |
| | beta | weight | beta | weight | beta | weight |
| Timing groups | 0.0001 | 0.64 | 12.6807 | 0.60 | 0.0011 | 0.60 |
| Never treated vs timing groups | -0.0004 | 0.36 | -86.3726 | 0.40 | 0.0243 | 0.40 |
| Within component | 0.2491 | 0.00 | 1248.2690 | 0.00 | -0.4931 | 0.00 |
| | | | | | | |
| | Treat6 | | | | | |
| | <i>Debt unsustainability</i> | | <i>Budget Surplus pc</i> | | <i>Financial distress</i> | |
| Coefficient (Std dev.) | -0.0001 (0.0002) | | -36.3584*** (12.9000) | | 0.0113*** (0.0016) | |
| | beta | weight | beta | weight | beta | weight |
| Timing groups | 0.0005 | 0.57 | -6.5378 | 0.54 | 0.0020 | 0.54 |
| Never treated vs timing groups | -0.0009 | 0.43 | -72.6553 | 0.45 | 0.0226 | 0.45 |
| Within component | 0.2316 | 0.00 | 1267.3983 | 0.01 | -0.4537 | 0.01 |
| | | | | | | |
| | Treat8 | | | | | |
| | <i>Debt unsustainability</i> | | <i>Budget Surplus pc</i> | | <i>Financial distress</i> | |
| Coefficient (Std dev.) | -0.0003 (0.0003) | | -32.1534*** (13.0754) | | 0.0108*** (0.0016) | |
| | beta | weight | beta | weight | beta | weight |
| Timing groups | 0.0004 | 0.43 | -12.2447 | 0.46 | 0.0022 | 0.46 |
| Never treated vs timing groups | -0.0008 | 0.57 | -48.6996 | 0.54 | 0.0181 | 0.54 |
| Within component | 0.0242 | 0.00 | -334.8441 | 0.01 | 0.0105 | 0.00 |

Regional differences

There are significant differences across Italian municipalities between the Northern and the Central-Southern regions in terms in economic development, institutions and social norms, with the latter ones lagging behind. Table 8 presents the results of the estimation in which an indicator for Central-Southern municipalities is added to the specification, interacted with the treatment indicator.¹⁰ The effect of the reform on municipalities’ public finances seem to be

¹⁰ Figures A1-A3 in the Online Appendix present the parallel trends for the three measures of public finances for Central-Southern municipalities.

driven by Central-Southern municipalities. Indeed, the reform seems to lead to a worsening of all the three measures of reported public finances in the Centre-South of Italy.

Table 8: Central-Southern municipalities

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|------------------------------------|------------------------------|----------------------|--------------------------|------------------------|-------------------------------------|---------------------|
| | <i>Debt unsustainability</i> | | <i>Budget Surplus pc</i> | | <i>Financial distress indicator</i> | |
| Treat6 | -0.002*** (0.000) | -0.002*** (0.000) | -0.621 (10.764) | 0.242 (10.917) | 0.005*** (0.002) | 0.006*** (0.002) |
| Treat6*Centre-South | 0.004*** (0.000) | 0.004*** (0.000) | -91.024*** (20.109) | -92.594*** (20.456) | 0.005** (0.002) | 0.004* (0.002) |
| Treat6+CS Treat6=0 [p-value] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Observations | 62,817 | 62,036 | 63,674 | 62,884 | 63,203 | 62,413 |
| Number of communes | 8,072 | 7,935 | 8,072 | 7,935 | 8,072 | 7,935 |
| Adjusted R-squared | 0.120 | 0.122 | 0.022 | 0.022 | 0.037 | 0.037 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample | Full | Restricted | Full | Restricted | Full | Restricted |

Notes. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

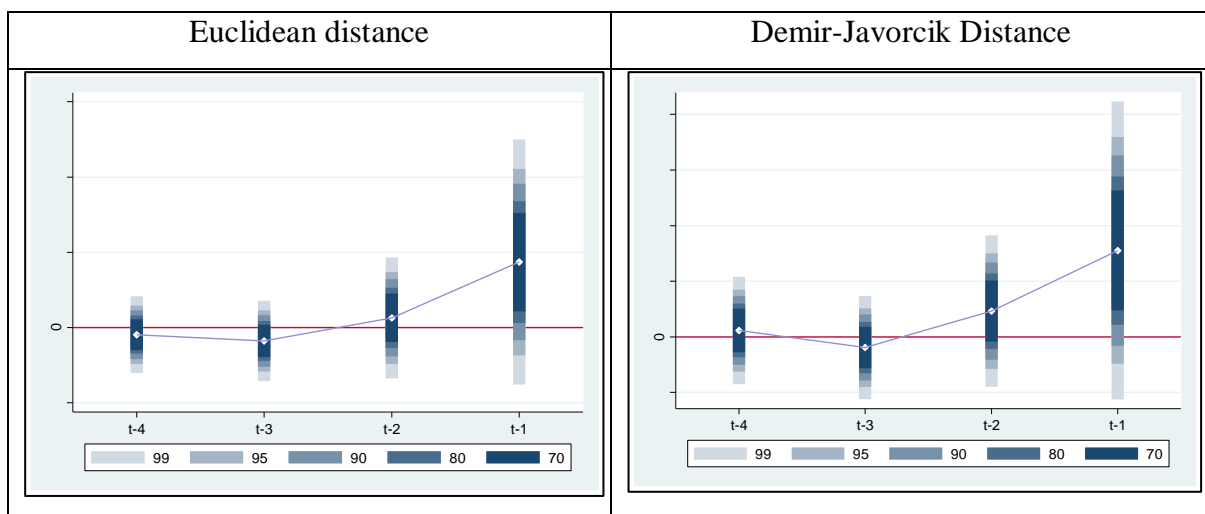
6. Mechanism: data truthfulness

The evidence presented so far seems to show that the introduction of auditors' random selection is associated with a worsening of municipalities' public finances, in particular in Central-Southern municipalities. The aim of this section is to explore the potential mechanism at play. The evidence provided by Duflo et al. (2013) indicates that in the Indian context, the absence of a random selection of third-party auditors led to severe underreporting of pollution emissions by auditors. Indeed, the worsening of public finances presented in the previous section would be consistent to the hypothesis that, in the absence of random selection, auditors might have engaged in data falsification under the old regime. Therefore, the next step is to investigate what happens to data truthfulness after the introduction of the new regime. We rely on Benford's law to create two measures of data manipulations. Benford's law is often used to detect data falsification, as it predicts a distribution for first digits of numbers in naturally arising data (Rauch et al. 2011, Demir and Javorcik, forthcoming). According to Rauch et al. (2011), in the presence of data falsification, "*assigned numbers [...] do not usually conform with Benford's law*". We compute two measures capturing the deviation from Benford's law on the basis of a number of financial statement items at municipality level. The first measure is the normalized Euclidian distance measure between the theoretical and empirical distributions of the first digit of financial statement entries (Rauch et al. 2011). The second

measure of data falsification relies on the recent work by Demir and Javorcik (forthcoming): we calculate the sum of the squared differences between the theoretical and the empirical frequencies of the first digit of each financial statement item (*Demir and Javorcik distance*). Table 1 reports the summary statistics of these two measures of data manipulation: the two measures are positively, but not perfectly correlated.

Before we proceed to analysing the effect of the reform on data falsification, we conduct the analysis of parallel trends for these two measures. Figures 5 and 6 present the parallel trends for the two measures: in both cases the two measures satisfy the parallel trends hypothesis.

Figure 3: Further parallel trends



We find no effect of random auditor selection on measures of data manipulations when the entire sample is considered.¹¹ However, a very different picture emerges when we restrict the sample to Centre-Southern municipalities. The effect of the reform is to reduce the distance between the theoretical and the empirical distribution of the first digits in municipalities' financial statements. The introduction of the random auditors' selection leads to a negative and statistically significant effect on both measures of data falsification. It is important to note that the reappointment rate of auditors before the reform was 65% in the Centre-South of Italy, compared to 46% in the North. The reform led to a dramatic decrease in the probability of reappointment to almost 0 both in the South and the North of Italy.

¹¹ See Table A2 in the Online Appendix.

Table 9: Benford's law – Central-Southern municipalities

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|--------------------|---------------------------|--------------------------|--------------------------|--------------------------------|--------------------------|--------------------------|
| | <i>Euclidean distance</i> | | | <i>Demir-Javorcik distance</i> | | |
| Treat4 | -0.00188*** (0.00063) | | | -0.00047*** (0.00014) | | |
| Treat6 | | -0.00192*** (0.00064) | | | -0.00047*** (0.00014) | |
| Treat8 | | | -0.00170*** (0.00062) | | | -0.00044*** (0.00013) |
| Observations | 27,912 | 27,912 | 27,912 | 27,912 | 27,912 | 27,912 |
| Number of communes | 3,546 | 3,546 | 3,546 | 3,546 | 3,546 | 3,546 |
| Adjusted R-squared | 0.074 | 0.074 | 0.074 | 0.089 | 0.089 | 0.089 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes |

Notes. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

7. Conclusions

An established literature has analysed the effect of audits on electoral accountability, corruption practices and the non-electoral cost of engaging in corruption. Most of these studies investigate the effects of random audits and how agents respond to the increased probability of being audited. But what happens in a scenario where third-party auditing is already the norm? Does the mode of selection of third-party auditors matter? This paper analyses this research question by drawing evidence from a reform introduced in Italy in 2011 (Law 148/2011). According to the reform, auditors of local governments are to be chosen by means of a random draw from a large pool of experts. The first effect of the reform was to drastically reduce the probability of auditors' reappointment in the same municipality. As a first step, we provide evidence that the random auditor selection led to a worsening of municipalities' reported public finances under the new regimes: treated municipalities have smaller budget surpluses and are more likely to be in financial distress. We interpret these findings as evidence in support of the random selection process reducing auditors' conflict of interest in reporting and auditing. This effect appears to be mainly driven by municipalities in the South of Italy. We further explore the potential mechanism at play and analyse the effect of the reform on data truthfulness, measured on the basis of Benford's law (Rauch et al. 2011). We provide robust evidence that the reform reduces our measures of data falsification in treated municipalities in the Centre-South of Italy. The worsening of reported local public finances can be attributed to the more accurate data

reporting: we conclude that the reform is effective in reducing auditors' conflict of interest in data reporting.

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Online Appendix to

Random auditor selection: evidence from Italian municipalities

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Table A1: Timing of the implementation

| <i>Year of the first draw</i> | <i>Percent</i> |
|-------------------------------|----------------|
| 2012 (December) | 4.26% |
| 2013 | 19.73% |
| 2014 | 31.47% |
| 2015 | 44.54% |

Table A2: Benford's law

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|--------------------|---------------------------|----------------------|----------------------|--------------------------------|----------------------|----------------------|
| | <i>Euclidean distance</i> | | | <i>Demir-Javorcik distance</i> | | |
| Treat4 | 0.00046 (0.00040) | | | 0.00006 (0.00009) | | |
| Treat6 | | 0.00041 (0.00042) | | | 0.00003 (0.00009) | |
| Treat8 | | | 0.00054 (0.00041) | | | 0.00005 (0.00009) |
| Observations | 63,674 | 63,674 | 63,674 | 63,674 | 63,674 | 63,674 |
| Number of communes | 8,072 | 8,072 | 8,072 | 8,072 | 8,072 | 8,072 |
| Adjusted R-squared | 0.019 | 0.019 | 0.019 | 0.024 | 0.024 | 0.024 |
| Pop controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes |

Notes. Standard errors are clustered at the municipality level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Figure A1: Debt unsustainability – parallel trends – Central-Southern municipalities

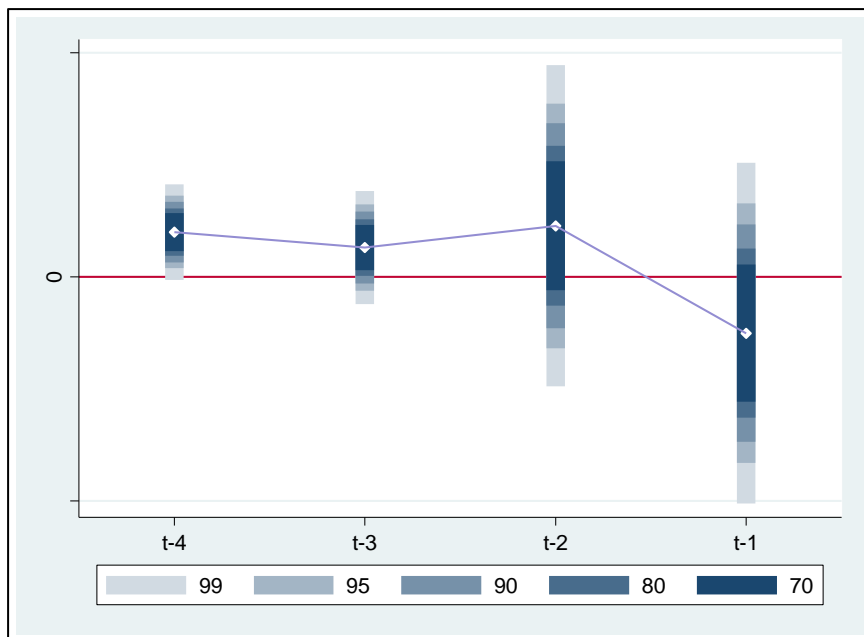


Table A2: Budget surplus pc – parallel trends – Central-Southern municipalities

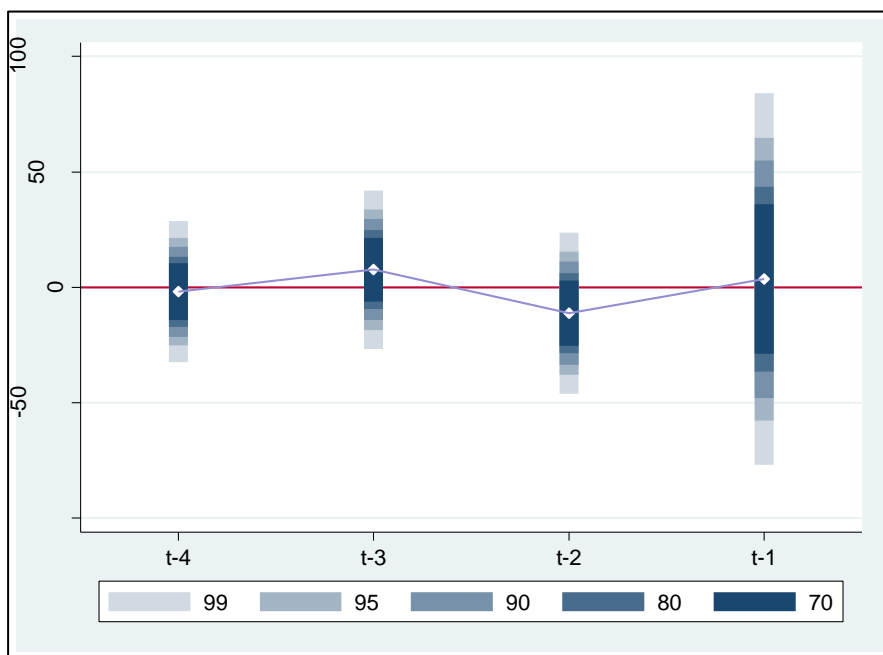


Table A3: Financial distress indicator – parallel trends – Central-Southern municipalities

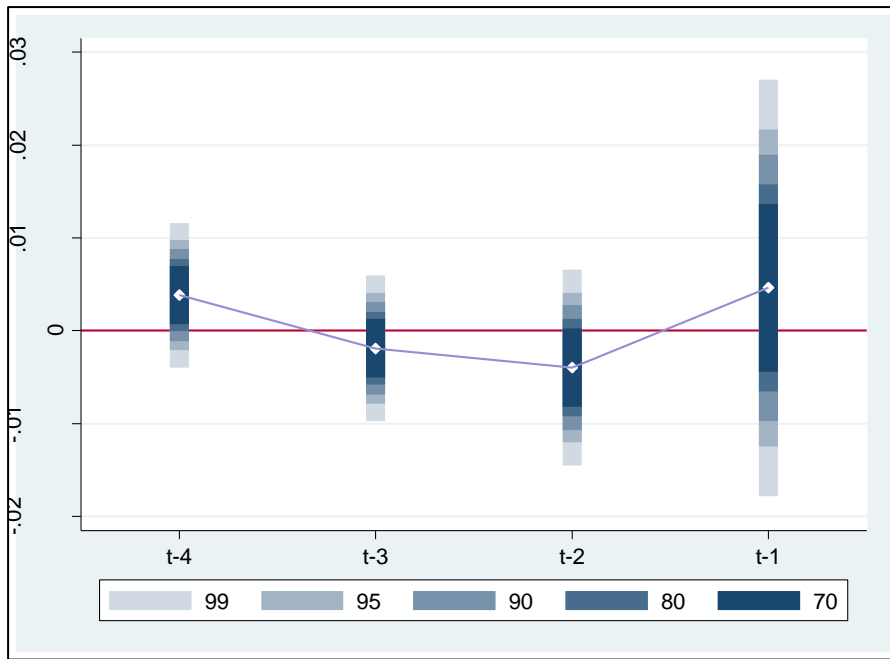


Table A4: Euclidean distance – parallel trends – Central-Southern municipalities

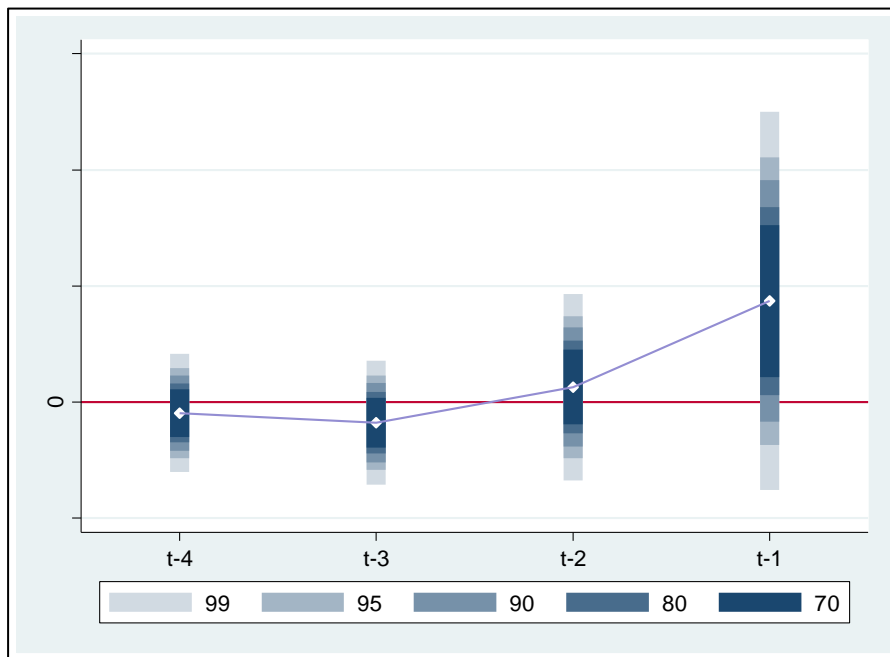


Table A5: Demir-Javorcik distance – parallel trends – Central-Southern municipalities

