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Little Lies, Sweet Little Lies: Motivations for Municipal Financial Statement Misclassification

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ABSTRACT

This paper aims at shedding light on the plausible motivations for misclassification of a public accounting report. This issue has not been studied by scholars as much as misreporting. We will analyze misclassification errors which occurred in Italy from 2008 to 2010. In 2008, the municipal tax on main houses (Imposta comunale sugli immobili, ICI) was substituted with an intergovernmental grant of an equal amount. About 38% of municipalities did not register the compensatory grants in the correct budget line. Our analysis suggests that misclassification errors respond to a willingness to reduce external stakeholders' pressure on local governments decisions.

JEL Classification: H71, H83

1 | Introduction

The aim of this paper is to shed light on the motivation for the misclassification of a public accounting report. Misclassification corresponds to reporting an item of a financial statement into a wrong line. In this case, the account balance's total value is not adulterated (Donatella and Tagesson 2020). This issue can be considered as different from misreporting, which refers to reporting wrong figures into the annual report and is often considered an illegal practice. In effect, misreporting is indicated as a practice usually used to avoid complying with budget rules; it consists in underreported/overreported figures to falsely meet deficit criteria or increase the spending capacity of the administration, thereby deliberately modifying also the account balance's bottom line (Fang, Huang, and Wang 2017; Beck 2018). Therefore, a broad body of literature is devoted to it. On the contrary, misclassification errors are overlooked by the literature and receive less interest also by external auditors, because they do not alter the balance of the financial statement and, for this reason, they are not usually considered illegal. Hence, they are deemed to be innocuous, hence acceptable accounting errors made by administration when drawing up financial statements.

We envisage misclassification errors as deliberate acts done in search of an edge, in this sense, filling the current gap with the intentional misreporting literature. The deliberate use of misclassification does not depend on benefits linked to the process of construction of financial statements. Our paper shows that the benefits of misclassification errors are not so tiny as they may appear.

When a government prepares a budget, it takes a lot of time to discuss it with the stakeholders. Also, the drafting of a final statement is time demanding because of discussions with stakeholders who verify congruence between the promise they were made when the budget was being formulated and the results that are shown in the final statement. Such discussions are demanding in terms of time, in terms of slowing down the pace of the internal organization of the public body, in terms of claims by stakeholders and thus of consensus for the policies adopted by governments. Such costs can be regarded as the transaction costs due to Hirshman's voice (1970). The discussion exerts a push in order to increase expenditure and reduce taxes. It is worth noting that stakeholders also pay a transaction cost in terms of time and of the attention required for

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participating in such discussions. Since attention is selective (Simon 1947; Jones 2003), stakeholders discuss the balance and some other pivotal figures such as taxes and/or expenditures level that each stakeholder is interested in. Furthermore, as Congdon, Kling, and Mullainathan (2009, p. 376) wrote: “Imperfectly rational people will respond to taxes in a way that is mediated by psychology”.

In our paper, we argue that public bodies use misclassification to modify external stakeholders' perceptions and the evaluations about the municipality's financial management by framing¹ the budget, thereby focusing the stakeholders' attention towards some items rather than others. The strategic use of misclassification errors can be motivated also considering that uncovering them could be quite tough, as the administration staff may keep the accounting documentation extensively generic (McVay 2006).

Indeed, we suggest that misclassification is too far to be a genuine error or a sign of lacking competencies with regard to accounting; on the contrary, it could be considered as a deliberate act that depends on the characteristics of governments, stakeholders, and the availability of other instruments to reduce their claims.

To study the misclassification problem, we will focus on the reform of the main municipal tax (*Imposta Comunale sugli Immobili*, ICI hereafter)² in Italy. We have chosen the Italian abolishment of ICI, since it is a genuine example of misclassification, well-defined in time and magnitude, for which a lot of data was available.

In 2008, one of the first measures of the incoming Berlusconi government was to cancel the municipal property tax levied on main residences (a part of ICI), and the National Government substituted it with an intergovernmental grant of equal amount. Up to 2007, tax revenues were registered in the ICI's dedicated line, where the amount coming from main houses (*abitazione principale*) was specified. From 2008 onwards, the financial statement representation changed and a new budget item appeared in Titulus 2 of Revenues (Transfers), namely, grants compensating for ICI on main houses (*Trasferimenti compensativi per ICI sull'abitazione principale*). Conversely, in Titulus 1 of Revenues (Taxes), ICI revenues were reported through the following items: ICI levied on luxury main houses (*ICI su abitazione principale per fattispecie non esenti*) and ICI levied on other real estates (*ICI su fattispecie diversa da abitazione principale*).

In the first year of the reform (2008), the 37.7% of municipalities did not register the new compensating grants in the correct budget line. In the 2009 and 2010, about the 25% of municipality still did not register them in the correct line of the financial statement. Fiorillo and Quaresima (2019) consider the accounting errors following the aforementioned reform as an expression of a general problem of misreporting. In this paper, we make one further step, providing a theoretical framework to discuss misclassification as a specific problem with respect to the more studied misreporting.

The Italian reform provides a good context to address our research question and allows us to focus on the misclassification

issue as a specific problem for three reasons. The first is that the change in accounting classification was very simple to apply. The new accounting schemes could be easily understood, and the line where the compensation transfer could be reported is clear. Secondly, because of said simplicity, an error in the first year of application of the new scheme could be immediately corrected on the report of the following years. For these two reasons, the significant magnitude of misclassification and its great persistence over the years cast many doubts on the possibility of considering such misclassifications as either pure random errors or errors due to lack of competencies of local public administrations. Thirdly, we can rule out that this behavior is an attempt not to comply with budget rules as in misreporting since the central government gives grants to municipalities and knows their exact values.

In the next section, we will review the literature on misrepresentation to find theoretical support to be applied in the case of misclassification. Indeed, in our opinion, some literature explanations on voluntary misreporting could apply also to misclassification. By relying on such literature, we will adopt an abductive approach, formulating a number of hypotheses and indicating the variables to corroborate them. Because the literature does not focus on misclassification as much as it does on misreporting, we fill this gap by testing the impact of variables to shed some light on which of them actually apply to misclassification. In Section 3, we will describe data, statistics to provide a thorough description of the phenomenon and the Heckman's approach to the dynamic probit model, which, because of the persistence of the errors in reporting, is the correct way to analyze our research question. In Section 4, we will present our estimation results. Section 5 will conclude the paper.

2 | Conceptual Framework

Although the literature provides several motivations for intentional misrepresentation in accounting reports (Mayper, Granof, and Giroux 1991; Van der Ploeg 2010), very little attention is specifically focused on misclassification (Nagar and Sen 2017). Because of the scant literature on misclassification, in this section, we will present different strands of literature formulating some possible, albeit not necessarily alternative, explanations, drawing them from the more extensive literature strands on misreporting, accountability and transparency. Specifically, we analyze these four issues: the voluntariness of misclassification errors, the role and the characteristics of external stakeholders in preventing or explaining misclassification errors, the role of mayors' competencies in shaping the incentives for misclassification, and the strategic misrepresentation in the budget.

2.1 | Voluntary Vs. Involuntary Errors

A certain degree of accounting fallacy is undoubtedly inevitable and unintentional. Local governments have often proved to lack personnel with the skills and competencies necessary for drawing up correct financial statements (Maran, Bracci, and Inglis 2018; Donatella and Tagesson 2020). Small and mountain towns should present relatively more often misclassified financial accounts, since municipal staff is often undersized and

frequently lacks updated skills. Furthermore, competent bureaucrats find such towns unappealing. In order to disentangle the effect of incompetency from that of strategic misclassification of financial statements, we use the following four proxies of municipalities that are incompetent because they are undersized and endowed with unskilled staff. Three population class dummies, namely, *Pop1000*, *Pop5000*, and *Pop15000*, are equal to 1 if the municipal population is, respectively, below 1000 inhabitants, between 1000 and 5000 inhabitants, and between 5000 and 15000 inhabitants. The fourth dummy *Mountain* is equal to 1 if the altitude is above 500 mt.³ If the four proxies are found to have a positive relationship with the occurrence of the error, then misclassification would be unintentional, to some extent. Once controlled for sources of unintentional misclassification errors, we propose to evaluate intentional manipulations in light of the following assumption about persistence and voluntariness.

Assumption 1. If misclassification errors are persistent, then they are also voluntary.

The reasoning behind this assumption is to some degree straightforward: If the administration, after a tax reform, erroneously classifies a budget sheet item but acknowledges the mistake and draws it up correctly the following year, the error can be considered unintentional. This is all the more true in the case of not so complex tax reforms, as the one we considered, which instead would require a simple adaptation to the new accounting rules. Conversely, if the wrong classification persists over time, it is more likely that we are dealing with a voluntary classification error.⁴ In case of persistence, the administration would have been “holding the position” in the next years. Moreover, precisely through the errors repeated over the years, the administration would show stakeholders its consistency, resulting from temporally homogeneous annual reports (Mahon and Wartick 2003).

2.2 | The Role and the Characteristics of the Stakeholders

In some cases, the accounting numbers of public-sector entities are manipulated because politicians and managers often face significant pressure from community and external stakeholders to be accountable for public resources and manage them adequately. Media, investors and especially citizens in their capacity as taxpayers, users of public services, and voters typically exert this type of pressure. According to Hodges (2017), several specific issues can be identified as motives for earnings management practices, such as reporting a break-even position to show that public services are provided at a reasonable cost or to underline that the entity is not charging excessive taxes. It is worth observing that if a public-sector entity does not achieve its predefined targets and/or it charges high taxes to citizens, both economic and political consequences can be significant (Cohen, Bisogno, and Malkogianni 2019).

As Sicilia and Steccolini (2017) state, the public budget has a multifaceted nature. The municipal financial statement could be intended as the main tool for checking the administration's efficient use of public money. Simultaneously, from the

municipality perspective, it represents also a communication device. Indeed, through definition and publication of the budget, the administration tries to meet citizens' needs and communicate its efforts for reaching them. Indeed, the budgeting process involves many stakeholders and it may be considered also as a narrative creation involved in the “construction of a social reality” (Covaleski and Dirsmith 1988). The literature on misreporting and transparency provides evidence of a linkage between the correctness and clarity of budget reporting and a number of citizens' and stakeholders' characteristics. However, how such features impact the financial statements' outline has not been conclusively defined. It is worth mentioning here that in the considered literature, city dwellers' education typically increases the public government transparency (Sol 2013). Since schooling most likely reduces the information asymmetry between the town council and residents, it should improve citizens' understanding of financial accounts (Ortiz-Rodríguez, Navarro-Galera, and Alcaraz-Quiles 2018). Informed citizens could push for the administration to present financial statements that will be evaluated positively by them (Beck 2018). The argument must be questioned. Many scholars note that educated citizens are more interested in participating in public life and decisions (Araujo 2016; Hillygus 2005). In spite of this, as Langella et al. (2023) note, the objective understanding of financial information is negatively related to citizens' participation. Instead, a greater participation is positively related to a greater conviction to understand such information, although this holds for citizens with low objective understanding. With an online survey experiment, Charbonneau and Van Ryzin (2015) find that citizens understand and respond differently to information depending on the reference benchmark. As Adam et al. (2019) state, education does not even provide specific knowledge for understanding public sector accounting. Thus, it does not help citizens to find out potential municipality budget classification errors, even if they willingly inquire after the city budget figures.

A plausible explanation is that citizens pay a cost in terms of attention and time when analyzing the municipal statements (Jones 2003). Rather than minimize the errors, the town council may let the intentional ones increase to gain legitimacy, face pressures from stakeholders, or underline that the administration is, among other things, not charging excessive taxes. Citizens will care about the town's annual report; they will be interested in it; nevertheless, they will not be able to discover, at no costs, possible financial report's inconsistencies, omissions, or unexpectedly large or small values. Therefore, the administration could embellish the municipal financial report with a very low risk of discredit and having a relatively wider audience for its misclassified annual report. The same effort for misclassifying the municipal financial items would not receive equal benefits in the case of less educated citizens, given their lower interest in politics and local public accounts.

Citizenship's political participation may be interpreted in different ways. On the one hand, a citizens' high monitoring activity towards local politics may induce the administration to be prudent and limit intentional errors (Gaventa 2002). On the other hand, for the town council, the same high monitoring activity makes the misclassification benefit higher, given the high number of interested citizens (Samuels, Taylor, and Verrecchia 2021) and the fact that misclassification is not penalized.

Also, participation and representation of foreign immigrant minorities have to be considered, since it has become a topical issue, especially at local level (Ortensi and Riniolo 2020). Indeed, migrants usually exert less pressure on local governments both because, in some cases, they have no voting rights and because they are less involved in city life.

Citizens' participation could be analyzed also considering electoral participation, the use of media, and the number of city associations. Kübler and Goodman (2019) and Fraga and Holbein (2020) consider the electoral turnout of the last municipal elections as a proxy for citizens' local political involvement.

The media play a fundamental role in stakeholders' participation, even though their effect could be questioned. Typically, the media generate attention for politically relevant issues, enable democratic processes, monitor governments, and provide public value. Local media play a relevant role in stimulating citizens to control the ways through which the town council spends local taxes and provides local public services. It is worth noting that, in the case of media capture (Besley and Prat 2006), they could simply amplify the information that administrations produce. Also, even in the absence of media capture, a local politician may be able to strategically exploit the media, choosing them to publicize financial statement figures or just increase their approval rating (Ozerturk 2018).

A large number of civic organizations corresponds to a high civic and political participation (Terriquez 2017). The number of associations could alternatively be interpreted as a proxy for the presence of interest groups that bring political pressure on local governments. On the one hand, groups' pressures could induce administrations to correctly disclose their financial account figures (Tagesson, Klugman, and Ekström 2013); on the other hand, there could be an incentive to increasingly embellish financial reports to limit the same pressures (Samuels, Taylor, and Verrecchia 2021). According to Pilcher (2011), politicians engage in opportunistic behavior to satisfy their self-interest when the pressure from stakeholders is intensive.

Since classification errors are characterized by a lower cost than misreporting errors, which are associated with explicit penalties, the following null hypothesis can be formulated:

Hypothesis 1. Factors that curtail or enhance civic participation have no impact on incentives for misclassification.

We will test the null Hypothesis 1 as we expect stakeholders' claims to increase with citizens participation and misclassification to be used to reduce such claims.

Citizens' participation is studied considering three variables, that is, the number of nonprofit *Associations per capita*, the number of copies of newspapers sold per capita (*Newspaper per capita*), and the *Turnout* of the last municipal elections. We also consider the interaction between *Population* and *Turnout* to capture that an increase in the participating population could result in a more pronounced pressure on local bodies and, hence, in a stronger incentive to misclassify. To test the impact of civic participation, we also consider three town characteristics: the

share of *Graduated* people, which is positively associated with participation; the share of migrants (*Ethnic*), which suggests lower participation in city life; and the *Touristic* dummy, used as a proxy for the high presence of second-home owners (commonly found in touristic municipalities), who can be considered a distinct group of stakeholders.

2.3 | The Competencies and Characteristics of the Mayor

It is possible that also Mayors' attributes could affect how much the city's financial account items are misclassified. Only a few studies have investigated the relationship between policy-makers' characteristics and political economy issues, for example, local authorities' financial statements correctness (Clemenceau and Soguel 2016; Anessi-Pessina and Sicilia 2019).

Competencies may be considered to play an ambiguous role: on the one hand, while more competent Mayors have more instruments to check and avoid the budget office's classification errors, and on the other hand, as Clemenceau and Soguel (2016) suggest, administrators could use such competencies to circumvent rules or take advantage of the information asymmetry, easily handling citizens' demands and stakeholders' requests. Zimmerman (1977) and Giroux (1989) show that if finance ministries are well-regarded as having the necessary expertise by citizens, they may have the incentive to generate an asymmetry of information among themselves, the spending ministries, and the taxpayers.

Also, the presence of a commissioner⁵ in place of the Mayor may affect the financial statements reporting activity given that the commissioner has no political incentives for misclassification. From this perspective, also term-limited Mayors, who cannot run for re-election, will have fewer incentives to misclassify the financial report and make more errors. Conversely, Mayors at their first term will indulge more in misclassification.

In considerations of all these arguments, we can test the following null hypothesis:

Hypothesis 2. The characteristics of Mayors play no role in determining the frequency of municipal budget misclassification errors.

Generally speaking, rejection of the null Hypothesis 2 implies that Mayors' competencies change the cost of and shape the incentives for misclassification. In the literature, the sign of the relationship is uncertain, but the nexus has been proved to be present. The Mayor's competencies that we use to test the hypothesis are described by dummies (*Mayor's Public Administration Competences*, *Mayor's Legal Competences* and *Mayor's Accounting Competences*). Depending on Mayors' competencies, the reputational cost linked to being careless in presenting the financial statement could be different. It is more likely to have some reputational cost if the Mayor has Public Administration or accounting competencies than legal competencies. On the contrary, a Mayor with legal competencies would be focused on the fact that there are no legal consequences and

penalties for misclassification. We consider also the age of Mayor (*Mayor's age*) and their gender (*Female Mayor*) and level of education (*Mayor's education*).

Political alignment (*Leftwing* and *Rightwing*), the term-limit (*Second term*), and the presence of a commissioner (*Not Mayor*) are also variables that can shape the incentive to use misclassification. *Second term* tests whether already re-elected Mayors and those who are serving their first term have different attitudes in relation to misclassification errors. *Not Mayor* verifies whether a commissioner has a lower incentive than a Mayor to misclassify the financial statement.

Finally, Bracco et al. (2015) suggest that the national government acts so as to favor the re-election of aligned local cabinets throughout larger intergovernmental grants. Following this line, an interest of local administrations in trying to favor the current aligned national government, through correctly reporting the full amount of the national grant, is also conceivable. If this hypothesis proves to be true, the same political affiliation (Variables *Left-wing*, *Right-wing*) between national and subnational administrations would be associated with less misclassification practice.

2.4 | Strategic Misrepresentation in Budgeting

As Reischmann (2016, p. 245) states, “governments can manipulate financial data to sugarcoat the budget balance, an issue that is well known and has been described as ‘creative accounting’, ‘accounting fudges’ and ‘cooking the books’, ‘fiscal adjustment illusion’, ‘fiscal gimmickry’.”

Several authors (Naser and Pendlebury 1992; Milesi-Ferretti 2004) underline that, in the 2000s, the European Union countries used creative accounting to meet the Maastricht criteria. In this case, creative accounting is used in order not to display the real deficit. Also, some states of the United States bypassed the rules in similar ways (Von Hagen 1991).

In this respect, a number of empirical works have shown that transparency is associated with lower debt and deficit. Among others, Alesina et al. (1999) show that more transparent budget procedures are associated with lower primary deficits.

Creative accounting can also enable a Mayor to hide a surplus. Indeed, as Anthony (1985) suggests, taxpayers consider an excessive surplus as resources that the government does not use for citizens. As Tellier (2006) suggests, reporting a surplus increases the claims to spend more or to reduce the tax burden. Giving in to the spending pressures of stakeholders could compromise the stability of the budget balance, in the long run, leading to future fiscal deterioration which could reduce the possibility to meet fiscal rules in the future or, even, to be re-elected. Because of costly tax collection (Hamilton 1986; Aragon 2013), such spending pressure is higher when expenditure is financed by transfers.

The Italian context is of interest also because municipalities have experienced strong financial constraints since 2008, which have provided additional motivation for financial statement

misclassification (Barbera, Guarini, and Steccolini 2016). As we specified in Section 1, we can rule out the attempt to not comply with fiscal rules, since the central government was perfectly awarded about the real amount of transfers. Thus, in our case, misclassification is used to modify the perception of how the deficit has increased, push back voters' critics, and preserving re-election chances. Misclassification is used to reduce the stakeholder claims that can be induced by both deficit and surplus.

Another issue investigated by the literature on strategic misreporting is the role of fiscal rules. Some authors have shown how fiscal rules encourage the use of questionable accounting practices, thereby decreasing the transparency of the administration budget (Clémenceau and Soguel 2017). Since in case of misclassification, there is no attempt to avoid fiscal rules, the above suggestion seems not to apply. On the contrary, the intuition of Rose and Smith (2012) seems correct. These authors suggest that the existence of a rule which limits politicians' discretion is a substitute for the reduction in the transparency enacted to have a slack of resources. Thus, fiscal rules can be opposed by local governments in order to limit stakeholders' pressure. Hence, in line with the suggestion of the literature on misrepresentation, we can formulate the following null hypothesis:

Hypothesis 3. An unbalanced budget, namely, one displaying either a deficit or a surplus, as well as the presence of a fiscal rule do not alter the incentives of municipalities to use misclassification.

In order to test the presence of strategic misrepresentation in budgeting, both *Surplus per capita* and *Deficit per capita* are considered to test the null Hypothesis 3. A rejection means that municipalities tend to make more reporting errors when out of balance. We will also consider a variable on the presence of surplus (*Dummy surplus*). Finally, we will use the *Stability pact* dummy variable to test the idea that the fiscal rule⁶ enforced for Italian municipalities weakens the incentive for misclassification.

3 | Data and Statistical Analysis

3.1 | The Data

In order to analyze the determinants of municipalities' misclassification errors, we built our database from various sources, such as the Italian Ministry of the Interior, ISTAT, and others (details in Table 1). The final sample is a balanced panel that covers the 2007–2010 period and reports features of municipalities and Mayors, financial figures of towns, and measures of citizens' participation in local politics. We considered the financial accounts data of 6701 municipalities.⁷ We excluded towns of the autonomous regions of Trentino-Alto Adige, Friuli-Venezia Giulia, Aosta Valley, Sicily, and Sardinia since their accounting and electoral systems are self-regulated. To provide a more comprehensive preliminary analysis, we considered the data on ICI registration 2 years before the nonluxury main-houses tax abolishment (2006 and 2007). From 2008 to 2010, the ICI reform was in force and the municipal property tax was replaced by a national government

TABLE 1 | Variables, data sources and hypotheses.

Variable	Description	Source of data	Hy.
No transf	Dummy variable, 1 if no transfer is registered in the correct budget line	*Database. Finanza Locale (2006–2010)	
Municipalities' features			
Year before election	Dummy variable, 1 if after the current year there is an election	*Database. Archivio Elezioni (2008–2011)	CTRL
Population (K)	Thousands of Municipal population at time t	• Database. Atlante stat. Comuni (2008–2010)	CTRL
Pop1000	Dummy variable, 1 if Municipal population at time t is < 1000	*Database. Atlante stat. Comuni (2008–2010)	CTRL
Pop5000	Dummy variable, 1 if Municipal population at time t is € (1000, 5000]	*Database. Atlante stat. Comuni (2008–2010)	CTRL
Pop15000	Dummy variable, 1 if Municipal population at time t is G (5000, 15,000]	*Database. Atlante stat. Comuni (2008–2010)	CTRL
Mountain	Dummy variable, 1 if Municipal average altitude > 500 mt	*Database. ISTAT stat. geo. (2006–2008)	CTRL
Touristic	Dummy variable, 1 if touristic	*Database. Communiverso (2006–2008)	HI
Ethnic	Share of foreign population, % pt	*Database. Atlante stat. Comuni (2008–2010)	HI
Graduated	Share of graduated population, % pt	• Database. Repetto (2018)	HI

(Continues)

TABLE 1 | (Continued)

Variable	Description	Source of data	Hy.
Mayors' characteristics	Age of Mayor	• Database. Anagrafe amm. (2008–2010)	CTRL
Female Mayor	Dummy variable, equal 1 if the Mayor is female	• Database. Anagrafe amm. (2008–2010)	CTRL
Mayor's education	Years of education of Mayor,	• Database. Anagrafe amm. (2008–2010)	H2
Mayor's PA competences	Dummy variable, equal 1 if previous Mayor's job is within Public Administration	• Database. Anagrafe amm. (2008–2010)	H2
Mayor's legal competences	Dummy variable, equal 1 if previous Mayor's job implies legal competences (lawyer, judge)	• Database. Anagrafe amm. (2008–2010)	H2
Mayor's accounting competences	Dummy variable, equal 1 if previous Mayor's job implies accounting competences	• Database. Anagrafe amm. (2008–2010)	H2
Left-wing	Dummy variable, equal 1 if Mayor belongs to a left-wing coalition ^a	• Database. Anagrafe amm. (2008–2010)	H2
Right-wing	Dummy variable, equal 1 if Mayor belongs to a rightwing coalition ^a	• Database. Anagrafe amm. (2008–2010)	H2
Second term	Dummy variable, equal 1 if Mayor is at her second term	• Database. Anagrafe amm. (2008–2010)	H2
Not Mayor	Dummy variable, equal 1 if municipality is not ruled by a Mayor but by a central government official	• Database. Anagrafe amm. (2008–2010)	H2
Dummy surplus	Dummy variable, equal 1 if in t-1 municipality has a surplus	• Database. Finanza Locale (2006–2010)	H3
Deficit per capita	Amount of deficit per capita in t-1, thousands of euros. 0 if there is a surplus.	• Database. Finanza Locale (2006–2010)	H3
Surplus per capita	Amount of surplus per capita in t-1, thousands of euros. 0 if there is a deficit.	• Database. Finanza Locale (2006–2010)	H3
Stability pact	Dummy variable, equal 1 if internal stability pact rule holds	• Database. Repetto (2018)	H3
ICI ratio 2007	ICI received from the non-main houses on the ICI collected from principal houses (in 2007)	• Database. Finanza Locale (2006–2010)	CTRL
Main house ICI per capita 2007	Property tax revenue from main houses in 2007, thousands of euros	• Database. Finanza Locale (2006–2010)	CTRL

(Continues)

TABLE 1 | (Continued)

	Variable	Description	Source of data	Hy.
Citizens' participation	Associations per capita	Number of associations per capita	• Database. Repetto (2018)	HI
	Newspapers per capita	Number of newspapers per capita	• Database. Repetto (2018)	HI
	Turnout	Percentage of voters for the last municipal elections	• Database. Archivio Elezioni (2008–2011)	HI
	Population (K) * turnout	Interaction between population and turnout	• Database. Atlante stat. Comuni (2008–2010)	HI

and *Database. Archivio Elezioni (2008–2011)

^{a1}Leftwing-Rightwing = civic list.

grant. We did not consider data after 2010, since the local tax system changed again (because of l. 42/2009) and it was no longer comparable to the previous regulation.

We denote a misclassification error with the dependent dummy variable *No transf.* It is equal to one when municipalities did not register compensating transfer in the correct budget line.⁸ The lagged dependent variable is used to test persistence.⁹

We considered towns' characteristics, Mayor's features, financial statements' quantities, and the citizens' level of political participation as covariates. Each covariate is drawn from the reviewed literature and is used to test one of the hypotheses presented in Section 2 (see Table 1 for a summary). Furthermore, we control for the dummy *Year before election*,¹⁰ for the ICI revenues before the reform (*Main house ICI per capita 2007*) considering the tax level, in 2007, coming from the main domestic residences, and for the ratio between the ICI revenues coming from other buildings and the ICI deriving from main houses, again in 2007 (*ICI ratio 2007*).¹¹

3.2 | Preliminary Analysis: The Persistence in the Dependent Variables

Fiorillo and Quaresima (2019) investigate the persistence of behavior in registering compensating transfers. A large number of municipalities did not register compensating transfers in the correct budget line. The percentage is 37.7% in 2008; it decreases in 2009 and 2010, but it remains rather high (about 25% in 2010). Compared to Fiorillo and Quaresima (2019), we deepen the analysis considering transition matrix and detailing municipalities behavior. In Table 2, we study transitions among the municipalities that do not record the compensating transfers correctly: About 62% of them confirm the wrong registration in one or both the following years. Thus, municipalities that do not register grants remained the same in the 2008–2010 period. On the contrary, about 83% of the municipalities that did register the compensating transfer correctly in 2008 did the same in the following year. Therefore, the above statistics on transitions strongly suggest a dynamic characterized by a nonnegligible persistence rate. In Table 3, we report the details regarding municipalities, errors made, and years.

The set of statistics presented in Table 3 is a further sign of misclassification persistence. In particular, we would like to draw attention to the share of towns misclassifying the annual report every year after the reform, with almost one-third of the municipalities making at least one misclassification error.

3.3 | Methodological Approach

In Section 3, the descriptive analysis of the dependent variable shows great persistence throughout the years. Thus, the analysis should be able to detect the reasons behind the initial misclassification and the subsequent behavior.

Since our dependent variable seems a state-dependent dummy, a dynamic probit model should be the appropriate estimation

TABLE 2 | Transition matrix.

	→ No transf 2009	No transf 2009	No transf 2009	→ No transf 2009	Total
	n	n	n	n	
	→ No transf 2010	No transf 2010	→ No transf 2010	No transf 2010	
No transf 2008 = 0	3251 (82.70%)	192 (4.88%)	194 (4.94%)	294 (7.48%)	3931 (100%)
No transf 2008 = 1	848 (38.03%)	867 (38.88%)	339 (15.20%)	176 (7.89%)	2230 (100%)
Total	4099 (66.53%)	1059 (17.19%)	533 (8.65%)	470 (7.63%)	6161 (100%)

Note: Missing: 540.

TABLE 3 | Misclassified final balances by years.

Years	Misclassified final balances	frequency
Only 2008	829	28.9%
Only 2009	190	6.5%
Only 2010	294	10.3%
2008 and 2009	336	11.7%
2009 and 2010	190	6.6%
2008 and 2010	172	6%
2008 and 2009 and 2010	853	30%
Total	2864	100%

Note: Missing: 513.

model. For this reason, we adopted the Heckman (1981) methodology to estimate a dynamic random effects probit model, although the panel length is rather short. We opted for this methodology, and not for the one proposed by Wooldridge (2005), because it enables us to explicitly measure both the determinants of the initial response to the ICI reform and the factors affecting the dynamic adjustment response of municipalities in the following years.¹²

4 | Results

We estimated several different specifications, in order to understand how a municipality immediately reacts to the property tax abolishment in terms of misreporting error (initial response) and how it adjusts its reaction in terms of misreporting errors in the following period (adjustment response). The persistence of the initial response is tested considering the lagged dependent variable in the adjustment response estimation. In what follows, we will refer to the model in Table 4, which includes all the available regressors.¹³

The probability of experiencing a classification error at time (t) positively depends upon the probability of having made the same misrepresentation at time (t-1). Since municipalities tend

to repeat such kind of inaccuracy previously made, it would seem that errors are voluntary.¹⁴ From this point of view, we may assume that

Assumption 2. When the parameters associated to independent variables are positive in dynamic adjustment response, the motivation to persist in the misclassification errors is enforced. On the contrary, negative parameters shed light on the factors that induce a correction of misclassification errors.

This assumption helps to better identify if errors are voluntary or not.

In any case, there are hints on the existence of a relationship between misclassification and lack of competencies. The control variables *Mountain*, *Pop1000*, and *Pop5000* all display the expected signs.¹⁵ *Mountain* and *Pop1000* are significant and positive both at the time when the reform was just introduced (initial response) and in the subsequent years (adjustment response). *Pop5000* is significant only in the initial response, suggesting that municipalities that are not too small may correct the misclassification.

When we study the effect of citizens' participation on the incentive to make misclassification errors (*Hypothesis 1*) we note that many variables have a significant effect. In particular, the rate of graduated citizens (*Graduated*) increases misclassification in adjustment responses. Therefore, in the presence of a high rate of graduated citizens, local governments have a greater need of hiding compensating grants, in order to justify their policies and taxation with the absence of the national government compensating grants.

The fact that the *Number of association per capita* is significant and positive in the adjustment response suggests that the citizens' pressure is a valid motivation for making and maintaining classification errors.¹⁶ Note that electoral participation (*Turnout*) seems to play a positive role in misclassification only at the outset of the reform and when considering the interaction with *Population*. This result suggests that an increase in the participating population could reinforce the pressure on municipalities, thus making them more prone to misclassify. This effect is captured by the term of interaction between *Population* and *Turnout*.

TABLE 4 | The determinants of misrepresentation.

	Initial response	Adjustment response
Constant	-0.8333 *	-1.112 **
	(0.46)	(0.4744)
No transf_1		0.745 ***
		(0.0937)
d ₂₀₁₀		0.0203
		(0.0397)
Main house ICI per capita 2007	0.0567	
	(0.0383)	
ICI ratio 2007	0.0002	
	(0.0004)	
Year before election	-0.0059	-0.0802
	(0.0918)	(0.0566)
Pop1000	0.9167 **	0.6052 *
	(0.358)	(0.3667)
Pop5000	0.7944 **	0.3631
	(0.3531)	(0.3603)
Pop15000	0.0662	0.1857
	(0.1177)	(0.1362)
Mountain	0.1256 **	0.1652 **
	(0.0609)	(0.0645)
Touristic	0.2172 ***	0.1916 **
	(0.074)	(0.0814)
Ethnic	0.0002	0.0001
	(0.0001)	(0.0001)
Graduated	4.32e-05	4.64e-05*
	(2.72E-05)	(2.69e-05)
Population (K)	-0.0517 *	-0.0183
	(0.0291)	(0.023)
Turnout	-0.1964	-0.467
	(0.3007)	(0.3112)
Population (K) * Turnout	0.0623 *	0.022
	(0.0375)	(0.0312)
Associations per capita	-0.4113	0.1141 *
	(0.3123)	(0.0688)
Newspapers per capita	0.0292	0.004
	(0.0168)	(0.019)
Mayor's age	-0.0047 **	-0.0009
	(0.0023)	(0.0024)

(Continues)

TABLE 4 | (Continued)

	Initial response	Adjustment response
Female Mayor	−0.0055 (0.0707)	0.0026 (0.0751)
Mayor's education	−0.0003 (0.0068)	−0.01 (0.0074)
Mayor's PA competences	−0.3277 ** (0.1598)	−0.0152 (0.1556)
Mayor's legal competences	−0.0062 (0.1011)	0.2431 ** (0.1002)
Mayor's accounting competences	0.1298 (0.2463)	0.1023 (0.2856)
Left-wing	−0.18 *** (0.0651)	−0.0129 (0.0801)
Right-wing	−0.2292 *** (0.0822)	−0.1 (0.0782)
Second term	−0.0887 * (0.0469)	−0.0569 (0.0459)
Not Mayor	−6.5438 *** (0.3193)	0.2199 (0.5014)
Dummy surplus	0.035 (0.0457)	0.046 (0.0445)
Deficit per capita	−0.0619 (0.2472)	0.5867 *** (0.2114)
Surplus per capita	0.5142 *** (0.1994)	0.1261 (0.1628)
Stability pact	0.656 ** (0.3327)	0.0393 (0.3371)
Regional controls	Yes	Yes
θ		0.7414*** (0.0725)
σ_α		1.0768*** (0.1163)
Log-likelihood		−8 069.734
AIC		16 319.468
BIC		17 013.664
HQC		16 548.697

Note: Standard errors in parenthesis.

Considering the dummy *Touristic* as the presence of second houses owners, the positive and significant sign suggests that local government would probably hide ICI compensating grants, and thus ICI collected taxes, on main properties to better justify the fiscal burden borne by second houses owners.

Considering the Mayor's characteristics and competencies, the effect is not unique (*Hypothesis 2*). Mayors with public administration experience (*Mayor's PA competences*) are able to limit their municipalities' budget misrepresentation (significant and negative effect on classifications errors in the initial

response). Well-learned Mayors, with public administration competencies, probably better understand the municipal affairs procedures and better advise and supervise city's staff, reserving particular attention to the correctness of the budget report. We may argue that for such Mayors, there is a statistically significant reputation cost in presenting a careless financial statement, so that they try to correct classification errors over time.

Local governments with younger Mayors (*Mayor's age*) make fewer classification errors too. Although the reputational motivation may hold also for young Mayors, a different explanation is possible as well. Younger Mayors may be less experienced and shrewd than older Mayors, who could indulge in misclassification, being more aware of its costs and benefits.

As to specific competences in the dynamic equation, an apparently counter-intuitive result emerges. In the presence of Mayors with legal expertise (*Mayor's legal competences*), errors in classifying the grants figures increase. Our interpretation is the following: a Mayor, previously most probably a lawyer, knows exactly the legal consequences of financial statement misclassification. Nevertheless, no penalty is actually expected for such errors. A law-competent Mayor could indulge more in "cooking the books", given that they are more aware of the absence of penalties for such final budget misrepresentation compared to other Mayors with different professional backgrounds.

A political affiliation diminishes the probability of misrepresenting the budget with respect to civic lists. When the reform is introduced, this is true for both parties (*Left-wing* and *Right-wing*). Our interpretation is that Mayors who are affiliated to a national coalition have access to a network that could advise them on the correct way of representing the budget.

The grants' omissions are lower, even if significantly only in the initial response and also if the municipality is under special administration (*Not Mayor*). This could be related to a greater attention of commissioners compared to elected Mayors towards the correctness of the accounts representation. Moreover, a commissioner has no electoral incentive to gain citizens' consensus through misclassification practices.

Another political economy aspect regarding misclassifying budget accounts is evident, as regards the initial response to the reform, from Mayors at their second and last term. The variable in question is significant (at 10%) and negative. In this case, Mayors could ignore the requests of the stakeholders and have lower incentives towards misclassification since they cannot be re-elected.

Also financial variables matter as *Hypothesis 3* suggests. It is worth noting that there are different behaviors regarding the initial response and the dynamic adjustment. When the reform is just introduced, the coefficient relative to surplus per capita of the previous year (*Surplus per capita*) is positive and highly significant (at the 1% level). Growing values of surplus cause an increase in the errors made in registering the compensating grants. In our view, this positive figure could mean that a municipality with abundant resources tries to hide grants in order to avoid spending pressures from citizens, firms, or unions.

Moreover, the impact of *Stability pact* is negative and highly significant in the initial time. The creation of a prudential slack can also be attained by opposing the fiscal rule to the citizens' spending pressure. Accordingly, there is a weaker incentive to use misclassification strategically.

In the adjustment response, also *Deficit per capita* comes to matter and misclassification increases with that variable. It is noteworthy that citizens' blame against a deficit may be stronger under a fiscal rule. Then, in the adjustment response, municipalities facing a high deficit could attempt to use misclassification errors to support their claim that the national government grants insufficient resources to local governments, thus putting them in a position to run a deficit for the provision of goods and services to citizens. In other words, misclassification errors give the local government a chance to preserve citizens' trust or, at least, shift the blame of deficit onto the national government.

5 | Concluding Remarks

Financial statements should truthfully outline the relevant budgetary data of any economic organization, be that a private firm or a public entity. Regarding local governments, the various stakeholders get information from the municipal annual report, which thus constitutes the base for their approvals or claims about the administration. When the informative role of financial reports is considered, incentives for misrepresentation emerge. Although the reasons why public governments misrepresent the budget is broadly studied, so far little attention has been devoted to the practice of misclassification. The strong persistence, as evidenced in our work, indicates that misclassification errors cannot be simply considered as inevitable oversight and would deserve a more careful assessment by both scholars and practitioners such as external auditors.

According to our findings, misclassification should not be considered the same as misrepresentation. Unlike misreporting, misclassification is not aimed at altering the final results in the financial statement. Rather, it permits to limit the stakeholders' pressure through the framing of annual reports. It amounts to telling "little lies" to the citizens who are more interested and engaged in public affairs, economic and political issues. Misclassification can modify how the informative content of accounting reports is perceived by stakeholders, as it is suitable to drive their attention towards some specific items and affect their appraisal of how the budget outcome has been achieved. For this reason, it is a practice that local public administrations purposely follow to reduce claims and increase approval.

In particular, our paper suggests that, as a greater citizens' participation is connected with more claims and pressure, it ends up increasing the incentive to misclassify. Indeed, in the presence of citizens who are more educated and more interested in the municipal accounts, our estimations highlight an increase in misclassification aimed at reducing spending pressures.

A second suggestion regards the role of a competent Mayor. We found that Mayors with public administration competences

report budget figures with more accuracy. They are more likely to have a good understanding of municipal accounts procedures and may think that misclassification could undermine their reputation. The contrary occurs when the Mayor has a background in law. In this case, law-competent Mayors could indulge more in misclassification because they are aware that there are no penalties for this kind of practices. Lower incentives to misclassify characterize second-term Mayors and municipalities administrated by a commissioner, as our analysis confirms.

Lastly, as regards financial variables, our estimations suggest the importance of some instrument being available to oppose stakeholder's claims. Indeed, we show that municipalities with a surplus have a stronger incentive to hide compensating grants in order to avoid spending pressures from citizens, firms, and other stakeholders. On the other hand, the presence of a fiscal rule, such as the internal stability pact, weakens the incentive to misclassify given that the fiscal rule may be used for contrasting the citizens' spending pressure.

One final point is worth making. Misclassification is a subtle but powerful tool because, given the high number of budget lines, it can be difficult to detect even under tight accounting rules, as introduced in Italy with the 2011 accounting reform. This adds on the motivation for further investigation by both scholars and practitioners. From this point of view, our paper opens a line of research. In the future, scholars could pay greater attention to disentangling pure errors due to incompetency from strategic misclassification. This would require collecting data on the actual competencies of bureaucrats and civil servants, so as to push the analysis beyond the use of proxies as in our paper. Moreover, since misclassification is motivated by the attempt to influence the perspective of both voters and other stakeholders, the results of this paper can further be used to study how this strategy is affected by other relevant factors, such as vote share, political competition, criminal record of the Mayor, number of citizens claims. Given that data on these factors are typically not available as secondary ones, proper surveys should be organized to collect them and extend the analysis in these directions.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Endnotes

¹ Frame is related to how a fact or information is expressed, so that Kahneman and Tversky (1979) propose prospect theory as an explanatory alternative. This theory states that the framing (framing of information) adopted by a person can influence the decision made.

² In Appendix A, we clarify the institutional aspects of this tax.

³ We also control for the population size and add regional dummies.

⁴ Although we cannot fully disentangle pure incompetency from strategic misclassification, it is little credible that, a year after the reform was introduced, more than 25% of the municipalities remained unaware of their errors. As we state in Section 1, the change in the accounting classification here considered was very simple to apply and an error in the first year of application of the new scheme could be immediately corrected. In our view, implementation of the new accounting rules was too simple for a competent municipality to be genuinely unaware of the misclassification errors.

⁵ In Italy, the rules governing the Mayor's replacement with a governmental commissioner are governed by Italian Legislative Decree 18 August 2000, no. 267.

⁶ For an extensive discussion of the Italian domestic stability pact, see Monacelli, Paziienza, and Rapallini (2016).

⁷ Our sample size is large enough to guarantee reasonable power and low *p*-values simultaneously (see Banerjee 2020; Maniadis, Tufano, and List 2014).

⁸ Note that we classify as a reporting error only cases where a municipality fails to record any value as compensating grants; for discrepancies between the actual value of transfers and the reported one, *No transf* is set to zero.

⁹ Since persistence is an important characteristic, we dedicated the preliminary analysis of the article to it and we chose the econometric method to investigate its existence in Section 4.

¹⁰ Ferreira, Carvalho, and Pinho (2013) provide evidence that there is a relationship between the pre-election period and earnings management when the political competition is strong. A positive effect of the pre-election period on the misclassification errors practice may be also expected, because politicians are expected to attempt to demonstrate financial results that are in line with users' expectations in the year before elections.

¹¹ Tables A.1 and A.2 present summary statistics and correlation matrix of such variables.

¹² The methodology here adopted is appropriate to consider the persistence of reporting errors. The probit analysis in Fiorillo and Quaresima (2019) does not account for state dependency; furthermore, it does not disentangle the initial response from the dynamic adjustment. As a robustness check, we also calculate the Wooldridge (2005) alternative to Heckman's approach. Results are not qualitatively different and are available upon request from the authors. Further nontechnical details are discussed in Appendix B. See Lucchetti and Pigni (2018) for a review and technical details of Dynamic Probit Model Estimation. Estimation is run using the *gretl* DPB package (Lucchetti and Pigni 2017).

¹³ In Appendix D, we estimate six specifications of the model using different x_{it} . Regional control dummies are added in every specification to capture a possible common regional behavior in financial statements reporting. The six specifications are as follows: BASE, which includes only towns' characteristics; MAYOR in addition to BASE entails the Mayors' socio-economic features; FINANCIAL, in addition to the variables contained in BASE comprehends municipalities' financial figures; PARTICIPATION includes towns' characteristics

and the three variables related to citizens' participation to public life; MAYOR+FINANCIAL includes the variables inserted in BASE, MAYOR, and FINANCIAL; lastly, we estimate the full model (ALL). Table A.3 reports the initial conditions equation of the model (initial response). In Table A.4, we show the dynamic model equation (adjustment response).

- ¹⁴ The previous state parameter is around 0.75 in all specifications estimated and is statistically significant at the one percent level.
- ¹⁵ A significant difference in terms of misclassification emerges between Southern and Northern municipalities, suggesting that the former tend to misclassify more than the latter. Details on regional dummies are available with the authors.
- ¹⁶ In the initial response, it is not significant. In the model specification PARTICIPATION presented in the appendix, the use of media as a means of participation yields the same result.
- ¹⁷ As Anessi-Pessina and Sicilia (2015) stated, misrepresentation could be present both during the formulation and the execution of the budget.
- ¹⁸ Residuals played a role also from the entry point of view. Local governments have to register a credit as an entry; witness a tax credit, even if such credit would be never paid. In this case, at the end of the year, such a credit could remain in the final statement without devaluation and it was registered as an active residual (*residuo attivo*); this way, the positive part of the annual budget could be expanded. In order to avoid such possibility and the consequent budget manipulation, the local public accounting system was reformed in 2011 (L. 218/2011).
- ¹⁹ Capital revenues are registered in other *titula*.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Appendix A

The Public Accounting of Italian Municipalities

The public accounting of Italian municipalities is made single-entry financial statements. In particular, the positive registered entries are

credits (*accertamenti*) while the negative ones are debits (*impegni*). A local government is authorized to spend money only if the financial statements are in equilibrium, and then if the sum of positive entries is not lower than the sum of negative ones. Actually, during the years we considered in the paper, a budget surplus was requested because of the rule of the internal stability pact, according to which the sum of the positive entries should be substantially greater than the sum of negative entries.

In order to be authorized to spend money the city government must present the city preliminary budget to the city council; within the provision of such budget, it is authorized to spend money. Actually, during the budget year, the city government could change the forecast of the preliminary budget and ask to be authorized to make this change by the city council. In this way, the actual expenditure of a local government could be very different from the first provisional budget.¹⁷

Because of such possibility to continuously manage the budget, stakeholders try to make their lobby pressures during the entire years not only in the making of the preliminary budget which is less important than it could be expected. Moreover, stakeholders are also interested in the final budget statement, since it shows whether the local government keeps the promises it made to them.

The final statement contains the *accertamenti*, the new credit of the year (net of the canceled ones), and the *impegni*, the new debt that the local government intended to stipulate in the year, not necessarily the actual one. For instance, it was possible to decide to allocate resources for social needs in 2008, but no actual payments were made during the year nor any contracts were stipulated. At the end of the year, the city government could either cancel or not cancel such provisional exit from the final statement. In the second case, such expenditure becomes a passive residual (*residui passivi*) that could be spent during the years which followed 2008 without asking for Council's authorization since the authorization was provided in 2008. Basically, the (*residui passivi*) were a sort of pocket money that local government could spend without authorization. The only obligation is to be accountable for the payment made using such residual (*pagamenti in conto residui*) in the final budget statement.¹⁸ Also for these reasons, the stakeholders look at the final statement in order to understand whether the promises they receive from the government were kept.

Looking at the entry side, the current revenues of a public budget is divided into three *Titula*: in *Titulus 1*, tax revenues are registered; in *Titulus 2*, revenues from intergovernmental transfers are registered; in *Titulus 3*, revenues from fees and tariffs are registered.¹⁹ Each *Titulus* is divided into subtitula, which are divided into budget lines. Among taxes (*Titulus 1*), the main local tax was ICI (*Imposta Comunale sugli Immobili*) which, in 2007, amounted to about 12 billion euros (about 2.6% of the total tax revenues in Italy). Such tax was born in 1992 (Italian Law Decree 333/1992, Italian Law 359/1992. Italian Legislative Decree 504/1992.); its tax base was the cadastral value of the real estate, the taxpayers were the property owners, each municipality could set different tax rates (from 0.4% to 0.7%) and deductions on each type of the real estate; moreover, the national law set a minimum deduction on main residences. ICI's revenues from main residences and other real estates are registered in two different budget lines of *Titulus 1*: *ICI su abitazione principale* and *ICI su fattispecie diversa da abitazione principale*.

In 2008, Berlusconi's Center-Right Government canceled the ICI on main residences, leaving it on the other kind of real estates. The canceled ICI on main residences was substituted by an intergovernmental grant of equal amount, which was registered in a new budget line in *Titulus 2*: *Trasferimenti compensativi per ICI sull'abitazione principale*.

In 2011, such taxation was completely eliminated and was substituted by IMU (*Imposta Municipale Unica*).

Appendix B

The Dynamic Random Effect Probit Model

Heckman's approach has the virtue of providing consistent estimates even if the initial conditions cannot be considered exogenous. In the case of

initial conditions correlated with the unobserved individual-specific random effects, as would be expected in most situations, a static RE Probit would be inconsistent and would tend to overestimate the effect of the state dependency.

The estimation of the model requires an assumption about the initial observations, in particular about their relationship with the unobserved individual effect. To proceed with the estimation we also needed to take account of the individual observed and unobserved heterogeneity, which causes spurious state dependence. Municipalities with unobserved adverse characteristics, for instance, may be led to make more errors, regardless of their previous state; ignoring this fact would lead to the overestimation of the true state dependence.

Taking all of this into account, our dynamic probit model can be written as a two-equation model, with the first equation estimating the initial response to the suppression of ICI and the second estimating the adjustment response:

$$y_{i1} = 1 \text{ if } y_{i1}^* = z_{i1}\pi + \varepsilon_{i1} = z_{i1}\pi + \theta\alpha_i + u_{i1} > 0 \text{ where } i = 1, \dots, N \quad (B1)$$

$$\begin{aligned} y_{it} &= 1 \text{ if } y_{it}^* = x_{it}\beta + \gamma y_{it-1} + \delta d_{2010} + \varepsilon_{it} = \\ &= x_{it}\beta + \gamma y_{it-1} + \alpha_i + u_{it} > 0 \end{aligned} \quad (B2)$$

$$\text{where } i = 1, \dots, N \quad t = 2, \dots, T$$

where y_{it} is the dichotomous dependent variable expressing error/no error, y_{it}^* the latent variable, y_{it-1} the previous state of the dependent variable (*No transf_1*) and ε_{it} the error term. The vector of explanatory variables is x_{it} in the adjustment equation and z_{i1} in the equation of the initial response. Note that, in the latter, the vector of explanatory variables includes the variables used in the adjustment equation and other variables w_{i1} which describe exogenous selection (instrumental) variables. In our estimation these are *ICI ratio 2007*, that is, the ICI obtained from the nonmain houses proportionally to the ICI collected from principal houses in 2007, and *Main house ICI per capita 2007*, that is, the ICI collected by the municipality from the principal houses in 2007 (main residences). d_{2010} is a time dummy that is inserted into the model to consider a possible last year of the sample time effect.

Since this is a random effect model, the error term is decomposed as follows: $\varepsilon_{it} = \alpha_i + u_{it}$ where α_i is the unobservable individual heterogeneity and $u_{it} \sim N(0,1)$ is the idiosyncratic term. As in any panel data model, assumptions are required about α_i . The standard random effects specification assumes $\alpha_i \sim iDN(0, \sigma_\alpha^2)$ and zero correlation between individual effects and the exogenous variables, that is $\text{corr}(\alpha_i, x_{it}) = 0$. Besides, no serial correlation is assumed for the idiosyncratic term u_{it} , and according to the mainstream literature, we assume "equicorrelation" of the composite error term ε_{it} (the correlation between successive composite error terms for the same individual is a constant).

Moreover, Heckman assumes endogenous variables having a probability distribution conditional on the exogenous variables and unobserved heterogeneity and estimates the model with a simultaneous two-stage approach. The first stage approximates the initial conditions by estimating a reduced form equation in which the explanatory variables include a set of instrumental variables; ε_{i1} is correlated with α_i but uncorrelated with u_{i1} . u_{i1} is independent of α_i , and the two distributions are, respectively, $N(0,1)$ and $N(0, \sigma_\alpha^2)$. Simultaneous estimation of the parameters of the dynamic and of the initial condition equations can be achieved by substituting them into a log-likelihood function without imposing any restrictions.

Appendix C

Descriptive Statistics

TABLE A.1 | Summary statistics.

	Mean	Std. Dev.	Median	Min	Max	N. obs
No Transf	0.3012	0.4588	0	0	1	19196
Year before election	0.1073	0.3095	0	0	1	19196
Pop1000	0.2368	0.4252	0	0	1	19764
Pop5000	0.4628	0.4986	0	0	1	19764
Pop15000	0.2106	0.4078	0	0	1	19764
Mountain	0.2488	0.4323	0	0	1	19761
Touristic	0.1081	0.3106	0	0	1	19764
Ethnic	6.1331	170.52	1.7354	0	9375	19755
Graduated	62.471	833.59	9.0909	0	21875	19755
Population (K)	7.5096	44.162	2.478	0.033	2743.800	19764
Turnout	0.7656	0.0916	0.7833	0.0397	0.9917	19658
Population (K)* Turnout	5.7018	31.813	1.8929	0.0033	2021.200	19658
Associations per capita	0.0067	0.1165	0.0038	0	13	18749
Newspapers per capita	3.5672	2.219	3.5188	0.2844	11.4590	19764
Mayor's age	51.5340	9.9124	52	23	87	19310
Female mayor	0.1109	0.3141	0	0	1	19354
Mayor's education	14.5610	3.4412	13	5	18	18733
Mayor's PA competences	0.0222	0.1472	0	0	1	18499
Mayor's legal competences	0.0507	0.2194	0	0	1	18499
Mayor's accounting competences	0.0066	0.0809	0	0	1	18499
Leftwing	0.1510	0.3581	0	0	1	19253
Rightwing	0.1174	0.3220	0	0	1	19253
Second term	0.3462	0.4758	0	0	1	19655
Not Mayor	0.0170	0.1291	0	0	1	19764
Dummy surplus	0.4310	0.4952	0	0	1	19697
Deficit per capita	0.0325	0.0965	0.0063	0	3.7665	19697
Surplus per capita	0.0179	0.1066	0	0	6.4941	19697
Stability pact	0.2965	0.4567	0	0	1	19764
Main house ICI per capita 2007	0.0642	0.6278	0.0381	0	45.2670	19743
ICI ratio 2007	5.9777	35.387	3.3813	-0.0329	2546.3000	19452

TABLE A.2 | Correlation coefficients.

Dyears_ election	Pop1000	Pop5000	Pop15000	Mountain	Touristic	Ethnic	Graduated	Population	Turnout	Pop_ turnout	Associations_pc	Newspapers_pc	Mayor's_ age	Mayor_ female
-0.0071	0.1011	0.0012	-0.0618	0.1049	0.0351	0.0030	0.0251	-0.0387	-0.0350	-0.0392	0.0076	-0.0856	-0.0122	-0.0218
1.0000	-0.0197	-0.0415	0.0314	0.0190	0.0237	0.0137	0.0050	0.0196	-0.0922	0.0182	-0.0001	-0.0846	0.0425	-0.0268
	1.0000	-0.5171	-0.2878	0.3501	0.0137	0.0253	0.0551	-0.0879	-0.0877	-0.0927	0.0050	0.0522	-0.0087	-0.0031
		1.0000	-0.4795	-0.0245	-0.0186	-0.0079	-0.0129	-0.1057	0.0047	-0.1108	-0.0119	-0.0199	-0.0061	0.0200
			1.0000	-0.2228	-0.0092	-0.0115	-0.0288	0.0119	0.0672	0.0150	0.0123	0.0197	-0.0011	-0.0029
				1.0000	0.1777	0.0084	0.0491	-0.0728	-0.2593	-0.0775	0.0158	-0.1114	-0.0146	-0.0338
					1.0000	0.0252	-0.0044	-0.0115	-0.0197	-0.0120	-0.0003	0.0823	0.0328	-0.0120
						1.0000	-0.0018	-0.0030	-0.0214	-0.0032	-0.0002	0.0212	-0.0072	-0.0054
							1.0000	-0.0077	-0.0710	-0.0083	-0.0013	-0.0115	0.0061	-0.0141
								1.0000	-0.0093	0.9982	-0.0013	-0.0213	0.0249	0.0109
									1.0000	0.0009	-0.0090	0.0853	0.0043	0.0297
										1.0000	-0.0015	-0.0235	0.0236	0.0078
											1.0000	0.0062	-0.0021	0.0078
												1.0000	0.0150	0.0952
													1.0000	-0.0875
														Mayor's age
														Female
														mayor

Mayor's education	Mayor's PA competences	Mayor's legal competences	Mayor's accounting competences	Leftwing	Rightwing	Second term	Not Mayor surplus	Dummy surplus	Deficit per capita	per surplus	Stability pact	house ICI per capita	Main house ICI per capita	ICI ratio
-0.0035	-0.0167	0.0221	0.0066	-0.0456	-0.068	-0.0381	0.0062	0.0591	0.0252	0.041	-0.091	0.016	0.0266	No Transf
0.0417	0.0092	0.0157	-0.0131	0.068	0.0245	-0.0055	-0.0201	0.0132	-0.0102	-0.0055	0.0643	0.0082	-0.0011	Year before election
-0.2103	-0.0097	-0.0634	-0.0078	-0.1553	-0.1717	0.0313	-0.0298	0.0431	0.1494	0.0939	-0.3617	-0.006	0.0631	Pop1000
-0.1819	-0.0257	-0.0744	0.01	-0.2529	-0.2797	0.0259	-0.0482	-0.0115	0.1001	0.0443	-0.988	-0.0265	0.0291	Pop5000

(Continues)

TABLE A.2 | (Continued)

	Mayor's education	Mayor's PA competences	Mayor's legal competences	Mayor's accounting competences	Leftwing	Rightwing	Second term	Not Mayor	Dummy surplus	Deficit per capita	Surplus per capita	Stability pact	Main house ICI per capita 2007	ICI ratio 2007
	0.1155	0.0155	0.0366	0.0036	0.0780	0.1315	0.0016	0.0120	0.0128	-0.0750	-0.0357	0.7718	0.0304	-0.0233
	-0.0557	-0.0028	-0.0141	-0.0017	-0.0558	-0.1393	-0.0152	0.0015	0.0642	0.0849	0.0567	-0.2935	-0.0086	0.0617
	-0.0179	-0.0209	-0.0137	0.0229	-0.004	-0.0062	-0.0057	0.0073	0.0279	0.0337	0.0339	0.0108	0.0072	0.0509
	-0.0075	-0.0038	-0.0061	-0.0019	-0.01	0.001	0.0162	-0.0036	-0.0008	-0.0046	-0.0032	-0.0148	-0.0009	-0.0006
	0.011	-0.0095	-0.0057	-0.0051	0.0013	-0.0159	0.0106	0.0035	0.0128	-0.0051	0.0076	-0.0368	-0.0018	-0.0014
	0.0698	-0.0005	0.0311	-0.0071	0.104	0.0997	-0.0151	0.0106	-0.005	-0.0195	0.0201	0.1976	0.0053	0.0006
	-0.0519	-0.0074	-0.0154	0.0093	-0.0191	0.0244	-0.0112	-0.023	-0.0543	-0.011	-0.0232	0.0737	-0.0078	-0.0031
	0.0719	0	0.0313	-0.0073	0.1077	0.1047	-0.0169	0.0121	-0.0043	-0.0212	0.0206	0.2079	0.005	0.0009
	-0.015	-0.0035	-0.0051	-0.0011	0.0027	0.0033	0.0038	-0.0033	-0.0052	0.0029	0.0021	0.0086	0.0974	0.0043
	-0.1332	0.0077	-0.0772	0.0025	-0.0232	0.0126	0.031	-0.0624	-0.1279	0.0592	-0.004	-0.0294	0.0125	0.0209
	-0.1958	-0.042	-0.1538	-0.0417	-0.0125	-0.0128	0.0509	-0.0041	0.0118	-0.0031	-0.0229	0.0155	0.0058	-0.0196
	0.0548	0.0235	0.0299	-0.016	0.0072	-0.0104	-0.0189	0.0088	-0.026	0.0018	0.0004	-0.0188	-0.005	-0.0084
	1	0.0693	0.23	-0.0039	0.0896	0.0442	-0.0395	-0.0288	0.0146	-0.0435	-0.0124	0.1825	-0.0093	-0.0154
		1	-0.0348	-0.0123	0.0254	0.0174	-0.0098	-0.0146	0.005	-0.0164	0.0016	0.0248	-0.0043	-0.0065
			1	-0.0188	0.0211	0.0591	-0.0259	-0.031	0.0159	-0.0202	-0.0131	0.0746	-0.0061	-0.0075
				1	-0.0103	-0.001	0.0153	-0.0008	-0.0031	-0.0042	0.0161	-0.0093	-0.0015	-0.0019
					1	-0.1538	0.0232	-0.0498	0.018	-0.0522	-0.0219	0.2558	-0.0046	-0.0168
					1	-0.044	-0.0467	-0.031	-0.0212	-0.0126	0.2789	0.0031	-0.0081	Rightwing
					1	-0.0958	-0.0232	0.0172	-0.0159	-0.0264	0.0191	-0.002	Second term	
					1	0.0257	-0.016	0.0031	0.0512	-0.004	-0.002	Not Mayor		

(Continues)

TABLE A.2 | (Continued)

	Mayor's education	Mayor's PA competences	Mayor's legal competences	Mayor's accounting competences	Leftwing	Rightwing	Second term	Not Mayor	Dummy surplus	Deficit per capita	Surplus per capita	Stability pact	Main house ICI per capita 2007	ICI ratio 2007	Dummy surplus	Deficit per capita	Surplus per capita	Stability pact	Main house ICI per capita 2007
								1		-0.293	0.1925	0.0143	0.0108	0.0073					
					1						-0.0564	-0.1004	0.003	0.0342					
											1	-0.0437	0.0015	0.0246					
												1	0.0269	-0.029					
													1	-0.0081					

Appendix D

Models and Estimation

TABLE A.3 | Initial response.

	Base	Mayor	Financial	Participation	Mayor + Financial	All
Constant	−0.69 *** (0.1431)	−0.2528 (0.2354)	−1.2726 *** (0.3419)	−0.5814 ** (0.2553)	−0.9278 ** (0.4019)	−0.8333 * (0.46)
Main house ICI per capita 2007	0.0485 (0.0377)	0.0402 (0.0307)	0.0479 (0.0378)	0.0746 (0.0561)	0.0389 (0.0305)	0.0567 (0.0383)
ICI ratio 2007	0.0002 (0.0004)	0.0002 (0.0004)	0.0002 (0.0004)	0.0002 (0.0004)	0.0002 (0.0004)	0.0002 (0.0004)
Year before election	−0.0217 (0.0837)	0.0034 (0.09)	−0.0231 (0.0839)	−0.0276 (0.0855)	0.0098 (0.09)	−0.0059 (0.0918)
Pop1000	0.4289 *** (0.1165)	0.261 ** (0.1304)	0.978 *** (0.3314)	0.418 *** (0.1207)	0.8962 ** (0.3546)	0.9167 ** (0.358)
Pop5000	0.2633 ** (0.105)	0.1288 (0.117)	0.8286 ** (0.3275)	0.2474 ** (0.1086)	0.7851 ** (0.3501)	0.7944 ** (0.3531)
Pop15000	0.1407 (0.1021)	0.0452 (0.1123)	0.1478 (0.1028)	0.1205 (0.1047)	0.0529 (0.1129)	0.0662 (0.1177)
Mountain	0.141 ** (0.0558)	0.1324 ** (0.0592)	0.1381 ** (0.0559)	0.1357 ** (0.0577)	0.1292 ** (0.0592)	0.1256 ** (0.0609)
Touristic	0.213 *** (0.0695)	0.233 *** (0.0738)	0.2089 *** (0.0695)	0.1979 *** (0.0701)	0.2268 *** (0.0737)	0.2172 *** (0.074)
Ethnic	2.62E-05 (1.10E-04)	2.75E-05 (1.06E-04)	2.89E-05 (1.10E-04)	1.63E-04 (1.20E-04)	3.03E-05 (1.06E-04)	1.55e-4 (1.20E-4)
Graduated	2.48E-05 (2.5E-05)	3.12E-05 (2.66E-05)	2.40E-05 (2.56E-05)	4.54E-05 * (2.71E-05)	3.05E-05 (2.67E-05)	4.32e-05 (2.72E-05)
Population (K)	−0.0039 ** (0.002)	−0.0034 * (0.0019)	−0.004 ** (0.002)	−0.0483 * (0.0269)	−0.0035 * (0.002)	−0.0517 * (0.0291)
Turnout				−0.1836 − (0.2841)		−0.1964 (0.3007)
Population (K) * Turnout				0.0571 * (0.0342)		0.0623 * (0.0375)
Associations per capita				−0.7119 (0.7615)		−0.4113 (0.3123)
Newspapers per capita				0.0368 ** (0.0157)		0.0292 (0.0168)
Mayor's age		−0.0044 * (0.0023)			−0.0044 * (0.0023)	−0.0047 ** (0.0023)
Female Mayor		0.0003 (0.0703)			−0.0003 (0.0702)	−0.0055 (0.0707)
Mayor's education		−0.0012 (0.0067)			−0.0016 (0.0067)	−0.0003 (0.0068)

(Continues)

TABLE A.3 | (Continued)

	Base	Mayor	Financial	Participation	Mayor + Financial	All
Mayor's PA competences		-0.3249 ** (0.1578)			-0.3298 ** (0.1582)	-0.3277 ** (0.1598)
Mayor's legal competences		-0.0097 (0.1007)			-0.0054 (0.1005)	-0.0062 (0.1011)
Mayor's accounting competences		0.1357 (0.2477)			0.1355 (0.2464)	0.1298 (0.2463)
Left-wing		-0.1956 *** (0.0647)			-0.1969 *** (0.0647)	-0.18 *** (0.0651)
Right-wing		-0.2438 *** (0.0821)			-0.2473 *** (0.082)	-0.2292 *** (0.0822)
Second term		-0.0888 * (0.0462)			-0.089 * (0.0462)	-0.0887 * (0.0469)
Not Mayor		-6.4184 *** (0.3183)			-6.412 *** (0.317)	-6.5438 *** (0.3193)
Dummy surplus			0.0347 (0.0428)		0.0474 (0.0451)	0.035 (0.0457)
Deficit per capita			-0.0328 (0.2205)		0.0587 (0.219)	-0.0619 (0.2472)
Surplus per capita			0.549 *** (0.2002)		0.5245 *** (0.2012)	0.5142 *** (0.1994)
Stability pact			0.5695 * (0.312)		0.6621 ** (0.3316)	0.656 ** (0.3327)
θ	0.7478 *** (0.0675)	0.718 *** (0.0666)	0.7567 *** (0.0695)	0.7481 *** (0.0692)	0.7256 *** (0.0683)	0.7414 *** (0.0725)
σ_α	1.0561 *** (0.1035)	1.1305 *** (0.1157)	1.0395 *** (0.1035)	1.0515 *** (0.1068)	1.1116 *** (0.1154)	1.0768 *** (0.1163)
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-9 312.9030	-8 296.419	-9 295.743	-9 008.429	-8 281.777	-8 069.734
AIC	18 733.8070	16 740.839	18 715.486	18 140.857	16 727.554	16 319.468
BIC	19 157.2420	17 313.317	19 201.626	18 625.234	17 361.893	17 013.664
HQC	18 872.7590	16 929.665	18 875.019	18 300.031	16 936.787	16 548.697

Standard errors in parenthesis.

TABLE A.4 | Adjustment response.

	Base	Mayor	Financial	Participation	Mayor + Financial	All
No transf_1	0,7466 *** (0.0841)	0.7076 *** (0.0924)	0.7579 *** (0.0842)	0.759 *** (0.0866)	0.7205 *** (0.0924)	0.745 *** (0.0937)
Constant	-1.4884 *** (0.1595)	-1.3567 *** (0.2533)	-1.6218 *** (0.352)	-1.2023 *** (0.2677)	-1.4111 *** (0.4177)	-1.112 ** (0.4744)
d ₂₀₁₀	0.0167 (0.0356)	0.005 (0.0393)	0.0206 (0.0357)	0.0252 (0.0365)	0.0097 (0.0394)	0.0203 (0.0397)
Year before election	-0.0698 (0.0525)	-0.0753 (0.0566)	-0.0686 (0.0523)	-0.0786 (0.0535)	-0.0736 (0.0563)	-0.0802 (0.0566)
Pop1000	0.5964 *** (0.1379)	0.6104 *** (0.1467)	0.6746 ** (0.342)	0.5817 *** (0.1472)	0.6155 * (0.3645)	0.6052 * (0.3667)
Pop5000	0.3151 ** (0.1234)	0.3253 ** (0.1308)	0.4163 (0.336)	0.3188 ** (0.1327)	0.3535 (0.3583)	0.3631 (0.3603)
Pop15000	0.1696 (0.1179)	0.1737 (0.1266)	0.1679 (0.117)	0.1676 (0.1246)	0.1687 (0.1253)	0.1857 (0.1362)
Mountain	0.175 *** (0.0585)	0.1832 *** (0.0647)	0.1681 *** (0.0581)	0.1649 *** (0.0601)	0.1747 *** (0.0641)	0.1652 ** (0.0645)
Touristic	0.1676 ** (0.0744)	0.2239 *** (0.0833)	0.1532 ** (0.0738)	0.1705 ** (0.0753)	0.2107 ** (0.0825)	0.1916 ** (0.0814)
Ethnic	-4.43E-06 (6.81E-05)	4.43E-06 (6.89E-05)	-1.09E-06 (6.77E-05)	6.61E-05 (6.64E-05)	7.49E-06 (6.84E-05)	7.52e-05 (7.13e-05)
Graduated	3.19E-05 (2.53E-05)	3.47E-05 (2.73E-05)	3.22E-05 (2.5E-05)	4.91E-05 * (2.64E-05)	3.51E-05 (2.7E-05)	4.64e-05* (2.69e-05)
Population (K)	-0.0033 (0.0024)	-0.0023 (0.0017)	-0.0032 (0.0024)	-0.0193 (0.026)	-0.0023 (0.0016)	-0.0183 (0.023)
Turnout				-0.4375 (0.2917)		-0.467 (0.3112)
Population (K) * Turnout				0.0213 (0.0342)		0.022 (0.0312)
Associations per capita				0.1879 (0.145)		0.1141 * (0.0688)
Newspapers per capita				0.0019 (0.0174)		0.004 (0.019)
Mayor's age		-0.001 (0.0024)			-0.0009 (0.0024)	-0.0009 (0.0024)
Female Mayor		0.0175 (0.0761)			0.0182 (0.0755)	0.0026 (0.0751)
Mayor's education		-0.0104 (0.0075)			-0.0105 (0.0074)	-0.01 (0.0074)
Mayor's PA competences		0.0004 (0.1572)			0.0039 (0.1561)	-0.0152 (0.1556)

(Continues)

TABLE A.4 | (Continued)

	Base	Mayor	Financial	Participation	Mayor + Financial	All
Mayor's legal competences		0.2229 ** (0.1022)			0.2271 ** (0.1013)	0.2431 ** (0.1002)
Mayor's accounting competences		0.093 (0.2946)			0.0855 (0.2902)	0.1023 (0.2856)
Left-wing		0.0085 (0.0809)			0.0021 (0.0803)	-0.0129 (0.0801)
Right-wing		-0.1023 (0.0797)			-0.1061 (0.0789)	-0.1 (0.0782)
Second term		-0.0572 (0.0463)			-0.0556 (0.046)	-0.0569 (0.0459)
Not Mayor		0.1809 (0.5175)			0.1822 (0.5112)	0.2199 (0.5014)
Dummy surplus			0.0509 (0.0407)		0.0443 (0.0444)	0.046 (0.0445)
Deficit per capita			0.5514 *** (0.2029)		0.5551 *** (0.2127)	0.5867 *** (0.2114)
Surplus per capita			0.1628 (0.1693)		0.1327 (0.1651)	0.1261 (0.1628)
Stability pact			0.109 (0.3172)		0.0398 (0.3399)	0.0393 (0.3371)
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parenthesis.