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Accounting manipulations in public sector: an empirical analysis of European Union countries' accounts

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Abstract: This paper detects whether and to what extent accounting manipulations take place during the reconciliation process from government accounts (GA) to national accounts (NA) when preparing the EDP tables required by the European Commission for each country. In the literature, different theories explain the 'why' of accounting manipulations and different models exist to detect 'how' accounting manipulations occur. However, there are scanty investigations aiming to measure the same phenomenon in the public sector. Investigating a period between 2002 and 2020, our findings show that accounting manipulations exist and have a wider diffusion across European countries. We feed the existing literature by highlighting the magnitude of accounting manipulations and to what extent existing differences between the GA and NA would automatically produce biased results. Finally, we design a new path towards selected fine tuning actions of GA and NA standards for the sake of a clearer European Union fiscal policy.

Keywords: accounting manipulation; government accounting; GA; national accounting; NA; accrual accounting; earnings management; European fiscal policy; excessive deficit procedure; EDP.

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1 Introduction

Despite the numerous advantages linked with adapting governmental accounting (GA) systems to the International Public Sector Accounting Standards (IPSAS), some countries are still unwilling to comply with an IPSAS-based accounting system. This is reflected in the member states' working balance shown in the excessive deficit procedures (EDP) tables, where most of the countries, even those that adopt the accrual accounting for reporting purposes, declare for EDP purposes a cash basis working balance.

The aim of the EDP is that EU countries correct excessive deficit and/or debt levels. The European Commission can launch an EDP against an EU country not respecting the stability and growth pact (SGP), a body of rules governing the coordination of EU countries' fiscal policies.

The issue regarding the conversion of the working balance derived from GA rules in the net lending/borrowing when compiling EDP tables, which is based on NA rules, has already been discussed by Dabbicco (2013), who underlines that even when the working balance is accrual based, many 'other adjustments' are necessary. Montesinos et al. (2019) explain that the convergence and harmonisation between the micro and macro data is totally necessary, as supported by the European Commission (EC), the IPSASB (2014) and other accounting standards boards. Therefore, the EC has recommended the use of harmonised European standards for the formulation of financial statements for the Government as a whole and its subsector. To do this, countries are required to apply adjustments that have a different materiality in relation to the GA framework of each

country. At the same time, countries need to apply adjustments complying with limits of deficit and with other restrictions concerning the SGP.

Therefore, to apply the needed adjustments, accounting management discretion could be used to manage the reported deficit working on GA-NA budgetary balance adjustments (Jorge and Laureano, 2014).

Recently, academics have launched a warning about the crucial need to standardise the conversion procedures in order to prevent earnings and/or fiscal stance manipulations while doing the adjustments (Jorge and Jesus, 2015; Jorge et al., 2016). Jorge et al. (2018) argue that accounting discretion might be used to window-dress the final deficit/surplus that countries must report to Eurostat. More in depth, there are some circumstances, which enable the use of GA-NA adjustment discretion.

The issue of accounting manipulations is an essential concern for scholars and for practitioners (Dechow et al., 2010). One reason for this interest is that the incentives for accounting manipulations are likely to increase in periods of financial crises, during which ‘cosmetic’ changes are generally used to meet balanced budget requirements, which would be difficult to reach (Anessi-Pessina and Sicilia, 2015). Another reason is related to the amplified prominence on individual governments’ financial responsibility, which is highest at the national level, but is also very high at a local government level (Anessi-Pessina and Sicilia, 2020). Accounting manipulation is a stimulating case of organisational decision making that involves interesting governmental dynamic, specifically the relations between politicians and public administrators (Guarini, 2016). Dechow and Skinner (2000) explained that accounting manipulations with the aim to violate national and international accounting standards are called earning manipulation and fraudulent accounting, while if management uses discretions without violating the accounting standards is called earnings management (Agyei-Mensah and Yeboah, 2019). Therefore, the terminology ‘earnings management’ is used to display the accounting records manipulation within the regulatory framework exploiting the flexibility permitted by the international accounting standards and by the local laws, and, consequently, it induces the stakeholders to have an erroneous image of the firm business (Yung and Root, 2019). We may refer this reasoning to public administrations too.

Starting from these considerations, the aim of this paper is to detect to what extent accounting manipulations were made by European Union (EU) countries when they prepared the EDP tables in the period 2002–2020. Thus, we would test their magnitude and if the manipulations were aimed at increasing or decreasing the net lending/borrowing declared for EDP purposes.

The paper reaches the aim by adapting existing models used in the private sector for detecting earnings management (Alareeni, 2018; Dechow, 2012; Dechow et al., 1995; Jones, 1991) to the public sector.

The empirical evidence reveals that, with different degrees, the accounts’ reconciliation is subject to manipulations. In particular, selected items, as the impact of economic transactions not included in the working balance, are object to the most impactful manipulations. These kinds of manipulations emerge as consequences of the so called off balance transactions, playing the effect of reducing the net borrowing or increasing the net lending. Further studies should investigate whether manipulations are the results of specific conditions of the country (i.e., the country is under the EDP procedure) or by other structural or technical issues.

The paper is organised as follows. Section 2 forms a bridge between the existing literature on different accounting frameworks in the public sector and the one concerning accounting manipulations, which has been historically developed mainly for the private sector. Section 3 provides the hypothesis development and method used. Section 4 presents the main findings, while Section 5 discusses the results from a critical standpoint. Section 6 proposes final remarks and open up avenues for future researches.

2 Literature background

2.1 Earnings management and ‘its brothers’ in private and public sector

The high number of accounting frauds that affected the business world in the last decades (e.g., Enron, Parmalat, WorldCom) has exposed the impressive failure of internal control system over the financial reporting process in many organisations (Gao and Zhang, 2019). Data of prior studies show that almost one in six fraud cases involves public sector entity (Huefner, 2011). Thus, also public sector entities are particularly vulnerable to accounting frauds (Anessi-Pessina and Sicilia, 2020), and this is due to weak internal controls that provide opportunities for organisations to be affected by accounting manipulation. Empirical works of international comparison among countries have illustrated that a high level of accounting manipulation witnesses a breakdown in the financial reporting process, which has also forced countries to apply harsh austerity measures and to be under financial supervision by EU authorities (Tsiouni et al., 2022; Kousenidis et al., 2013; Ballas and Tzovas, 2010).

Prior works in the private sector have identified two different kinds of earnings management, including earnings management based on accruals and on real earnings management (Owusu et al., 2022; Abad et al., 2018). Accrual-based earnings management occurs when management opportunistically uses accounting standards to manage earnings in a preferred direction (Kjaerland et al., 2020; Ayadi and Boujelbène, 2015), while real earnings management is defined by Roychowdhury (2006, p.336) as “management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds”. A situation of the accrual earnings management is required for positioning asset write-offs, while forms of real earnings management are research and development expenditure manipulation, overproduction, and sales manipulation (Dakhlallh et al., 2020; Fatma and Abdelwahed, 2010).

Other terminologies, like income smoothing or creative accounting, have been used to demarcate accounting manipulation (Jones, 2011; Lisboa, 2019). The expression ‘income smoothing’ indicates the circumstance under which managers use their reporting discretion to reduce negative changes in the company’s income (Trueman and Titman, 1988; Chen et al., 2019; Sarwary and Uman, 2022). There are two different opinions related to income smoothing practices. From one side, academics explain that income smoothing expands earnings informativeness if administrators disclose their valuation of future earnings to the stakeholders (Tucker and Zarowin, 2006); on the other side, income smoothing is a consequence of inexact earnings if administrators misrepresent income (Grant et al., 2009). As for the public sector, the blurred lines represented by both GA and NA frameworks that in certain circumstances would permit to put in action both earnings management and income smoothing practices.

Earnings management is a topic significantly explored in the private sector (Paiva et al., 2016; Malikov et al., 2018); while only a small number of pieces investigated the issue within the public sector. Indeed, while Dechow et al. (2010) examined about 300 papers related to the private sector, Cardoso and Fajardo (2014) analysed only 17 works focused on earnings management in the public sector. However, the presence of earnings management practice in public sector is not less relevant than in the private (Cohen and Malkogianni, 2021; Bisogno and Donatella, 2021). Recently, some scholars investigated the motivations for earnings management practices and factors that could stimulate or mitigate earnings management practices in public sector (Stalebrink and Donatella, 2021; Cohen and Malkogianni, 2021; Anagnostopoulou and Stavropoulou, 2021). However, there is scant knowledge about the motivations and the mechanisms behind earnings management in the public sector. Prior studies on private firms, revealed how the implementation of earnings management practices are thrilled by a variety of reasons (reduce costs of external financing, influence stock-market price, avoiding breaching debt covenants, etc.). Public organisations have different targets and, in turn, different reasons to pursue such behaviour. Indeed, public administrators have significant pressures from different groups of stakeholders (media, voters, taxpayers, superior authorities, etc.) to improve the results and to show that the public resources are appropriately managed (Cardoso and Fajardo, 2014). Thus, there is ample space for a better understanding about the incentives and techniques for earnings management in the public sector (Ballantine et al., 2007; Pilcher and van der Zahn, 2010).

The first attempt to detect earnings management in the public sector setting has emphasised that governments try to conceal deficits exploiting different accounting and reporting ‘tricks’ (Anthony, 1985), such as altering the timing of accounting recognition. Cohen et al. (2019a) noted that public sector organisations manipulate accounting figures because politicians and managers face significant pressures from stakeholders to allocate public resources adequately. The media, investors, financial markets, authorities and citizens, exert a pressure on public sector organisations exploiting their status quo of taxpayers, users of public services and voters (Cardoso and Fajardo, 2014). Therefore, in order to reach the specific results expected by the stakeholders, public-sector organisations have motives for earnings management (Hodges, 2017; Assidi et al., 2022). In fact, public sector organisations need to meet goals indicating that public services are provided at a fair cost, to emphasise that the government charges a reasonable amount of taxes, or to reach specific deficit targets (Tlemsani, 2021). It is understandable that if a public sector entity does not accomplish its predetermined goals and if it asks an excessive amount of taxes to taxpayers, political and economic negative effects may be significant (Cohen et al., 2019a).

2.2 The ‘why’ of manipulations: the public choice theory

According to Cohen et al. (2018), the public choice theory may explain the motives of earning management. Indeed, the theory analyses the interaction between stakeholder and people who govern public administrations (Buchanan, 2009). For the analysis of these intricate interactions, it is essential to bear in mind that the behaviour of each actor is stimulated by three main needs: to be very apprehensive with his own private interests, to amplify his advantage, and to take decisions with sense (Mueller, 2009). These needs combined with the aspirations of each stakeholder (e.g., voter, taxpayers, leader of a

political party) can alter personal interests (Cohen and Malkogianni, 2021). One of the aims of the public choice theory is to understand how politicians, who have a relevant influence on public administrators' decisions (Bello and Spano, 2015), operate considering the stakeholder expectations (taxpayers, voters, investors, etc.). More in depth, one of the principal aspects examined is the 'self-interest axiom', under which those politicians follow their individual interest rather than the citizens ones (Cohen and Malkogianni, 2021).

Another aspect that justifies public administrators' behaviour is the 'pressure of the competition' (Boyne, 1997), that incentivises them to operate showing better results to the other public entities. In this conflicting field, there is space for earnings management practices since all the parts want to satisfy their own interests. To achieve self-interest targets, public administrators use accounting information in a perverse way, with manipulations able to threat the principles of a fair governance (Guarini, 2016; Behn, 2001). Moreover, earnings management techniques are implemented when the stakeholders' push for an improved resource allocation and a higher financial stability, together with pressures that convey to their own interests, reaching a level in which the motivations and the circumstances make this behaviour feasible from public administrators (Cohen et al., 2019b).

2.3 The 'why' of manipulations: the agency theory perspective

Studies based on agency theory consider discretionary accruals as an instrument to carry out earnings management (Ferreira et al., 2013). In fact, public administrators (the agents) use accounting information as a method to show their performance, while citizens, voters and creditors (the principals) to inspect political activity. Thus, in a context of conflict of interest between principals and agents, the latter, to take different kind of informative advantages, can use earnings management techniques (Ferreira et al., 2013). Prior studies explain that re-election motives are important drivers of earnings management through discretionary accruals, exploiting financial information prepared on an accrual basis (Cohen et al., 2019a; Cohen and Malkogianni, 2021; Cuadrado-Ballesteros et al., 2019). The target of public entities to record stable near break-even net income induces public administrators to use depreciations as vehicles for implementing earnings management activity, due to the relevance of limited life assets in government financial statements and the reduced opportunities for manipulations of inventories and accounts payable (Pilcher and van der Zahn, 2010).

One of the reasons why public administrations implement earnings management is to hide their true deficits, in order to show good results to citizens, voters, authorities and financial market. Therefore, public administrators use technique like changing the timing of accounting recordings or forcing revenue recognition (Stalebrink, 2007). The widely use of accrual-based accounting to the public sector has increased the chances available to public administrators to exploit accounting discretion to manage financial results, since it increases the freedom to decide how to record the accounts and measure the value of assets and liabilities.

2.4 The 'how' of manipulations: the conversion process of GA into NA

The differences between GA and NA are a relevant research area in public accounting but, as noted by some academicians (Jorge and Laureano, 2014), it has not been the

subject of much study. Existing studies have mainly involved separate comparative analyses concerning central governments or local government entities. In the European Union context, GA and NA are connected because the bottom line in government accounts (surplus/deficit) is used as the starting (working) balance by the NA system to convert it into a statistical measure (also called 'deficit'), according to the guidelines established in the European System of National and Regional Accounts (ESA) (Caruana et al., 2019). The control of fiscal sustainability is concentrated principally on "two variables: (a) surplus (+)/deficit (–) of the general government sector, referred to the net lending (+)/borrowing (–), and (b) the government debt, defined as the total consolidated gross debt at face value in the following categories of government liabilities (defined in ESA, 2010): currency and deposits, debt securities and loans" (Montesinos et al., 2019).

In the European Union, there is a diversity of GA frameworks among countries (accrual accounting models and cash-basis accounting models), and within each country (different main accounting frameworks at different levels of government). The magnitude of differences between the micro and the macro levels are sometimes very relevant (Sforza and Cimini, 2017) and can reduce transparency and comparability across financial statements. Prior scholars explain that accounting discretion might be used to manage some adjustments made during the translation of data from GA into NA. As explained by Jorge et al. (2018), these adjustments are related to the scope of the general government sector (GGS), to the accounting basis, financial and non-financial transactions included in the balance, and to the lending/borrowing operations with other entities connected to the central government. These adjustments generate issues about the consistency of the final deficit/surplus reported within the EDP requirements, raising doubts on the correctness and reliability of NA data for measuring the Maastricht Treaty thresholds (3% as for the deficit/GDP ratio and 60% for the debt/GDP ratio), and examining EU fiscal policy. These topics are enhanced by the fact that some categories of GA-NA adjustments might be prone to management (Jorge et al., 2018).

The empirical research shows that there are certain circumstances that might facilitate the use of GA-NA 'adjustment discretion' (Jorge et al., 2018).

In general, the adjustments magnitude is negatively (positively) affected by economic growth (crisis) (Jorge et al., 2018). During periods of economic growth, accounting adjustments are not relevant since countries are able to maintain their accounts below the Maastricht thresholds, while during economic crisis, to avoid an EDP, accounting adjustments are higher. The GA-NA 'adjustment discretion' is influenced by the accounting framework used by the public administrations. In fact, if both GA and NA are formulated on accrual-basis they are already harmonised, and therefore there is less space for reconciliation, and, so far, accounting manipulation.

Finally, the most challenging issue is how to recognise, and empirically separate accounting manipulations occurred before the GA-NA reconciliation process from those occurred during the mentioned process. However, also during the conversion process a certain degree of discretion might be use as a direct consequence of plenty alternative treatments offered by the NA rules. This happens for a twofold reason. First, when the departing point is a cash working balance; second, when even the working balance is (to some extent) accrual, many differences arises during the reconciliation process to be fully compliant with NA rules.

Thus, we seek evidence of which kind of accounting manipulations are implemented during the EDP process from EU member states, resulting in a biased fiscal stance for countries that put in action intentionally or unintentionally those behaviours.

3 Methods and hypothesis development

Data used for the analysis have been gathered from the Eurostat website (EDP Tables 2 and 3) and Eurostat single-country visit reports. EDP Table 2 provides the reconciliation between the so-called GA working balance and the net borrowing/lending (also called 'deficit') in ESA accounts for each government subsector. Whereas Table 3 shows the deficit debt adjustment (DDA) procedure with GGS. Table 2 shows the subsector results without any consolidation process, whereas Table 3 gives evidence of the reasons why the general government gross debt is changed over time. Our sample is composed of all subsectors of the EU 28 from 2002 to 2020 (except for State Governments for which, by construction, data were not available). For many countries, there are missing information such as Croatia, Malta and the UK, and especially for what concerns the Social Security Fund subsector.

Thus, the model used for the study is built on unbalanced panel data. The power of panel data derives from their theoretical ability to isolate the effects of specific actions, treatments, or a wide number of general policies.

The choice to analyse single subsectors as units of analysis comes from the need to enlarge the observation for statistical purposes. This choice prevents us from introducing other structural variables to control the prediction model.

Following the EDP tables rules and previous studies in the field, we synthesise the contents of EDP Table 2 through equation (1).

$$(WORKBAL - F_TR) + NF_TR + EDP_D41_DIF + F7REC + F7PAY + SD3_ADJ + OTH_ADJ = EDP_B9 \quad (1)$$

where

- $(WORKBAL - F_TR)$ is the working balance net of the reclassification of financial transactions (hereafter $OP_WORKBAL$)
- NF_TR is the impact of economic transactions not included in the working balance.
- EDP_D41_DIF is the difference between interest paid and accrued.
- $F7REC$ is the time adjustment related to the account receivable.
- $F7PAY$ is the time adjustment related to the account payable.
- $SD3_ADJ$ is the result of other central government bodies.
- OTH_ADJ are the other adjustments.
- EDP_B9 is the net lending/borrowing under deficit procedure.

Supposing the absence of whatever kind of adjustments during the reconciliation, (1) can be expressed as (2).

$$EDP_B9 - OP_WORKBAL = 0 \quad (2)$$

If so, accounting manipulation would be impossible, and the result of the working balance determines a correspondent opposite change on debt. Since the NA rules are accrual-based, the total accrual (TA) effect can be expressed as follows:

$$TA_{it} = EDP_B9 - OP_WORKBAL \quad (3)$$

Hence, accounting manipulations have a dual origin. The first depends upon the GA rules from which the working balance is generated; the second depends on the single items included in EDP Table 2 and, thus, derives from the NA rules and their application during the EDP reconciliation process. To measure manipulations occurred during the reconciliation process, we use the discretionary accruals (DAs), which require to be estimated. The most popular discretionary model is the standard Jones model (1991). This model is able to divide accruals into discretionary (DAs) and non-discretionary (NDAs). When changes in sales are adjusted for the change in receivables, the Jones model becomes a modified Jones model, which is proposed for the first time by Dechow et al. (1995). The modified model is designed to reduce the measurement error of DAs when discretion is applied over sale. The study of Dechow et al. (1995) finds that a modified Jones model provides the most powerful test of earnings management. Thus, we adapt the modified Jones model to test our hypotheses, which, according to the literature reviewed and with the purposes of the study, are the following:

- H1 Selected items during the GA-NA reconciliation process are subject to positive or negative manipulations.
- H2 The discretionary accruals play a further role in determining the magnitude of manipulations by boosting or reducing the net lending/borrowing for EDP purposes.

The modified Jones model is applied starting from the following equation:

$$TA_{i,t} / A_{i,t-1} = \alpha_i + \beta_1 (1/A_{i,t-1}) + \beta_2 (\Delta REV_{i,t} / A_{i,t-1}) + \beta_3 (PPE_{i,t} / A_{i,t-1}) + \varepsilon_i \quad (4)$$

where

- TA_{it} , the dependent variable, is total accruals in year t for firm i , calculated as the difference between reported earnings before extraordinary items (EBEXTRA)
- $\Delta REV_{i,t}$ are the revenues in year t less revenues in year $t - 1$ for firm i
- $PPE_{i,t}$ is gross property, plant and equipment in year t for firm i .

For private firms, the total accruals are scaled per total assets ($A_{i,t-1}$) in order to standardise the variables used in the model with the aim of allowing an effective comparison among the results taking into account the difference among firms in terms of business dimensions.

To make an effective adaptation of the model we replaced the total assets with the gross domestic product (GDP), which represents a good proxy (even if with some limitations) of each country dimensions to make similar comparisons putting together all subsectors for each country. Moreover, we replace the other variables used in the original model using those retrieved from the GA-NA conversion process expressed in (1). Hence, the model can be adapted as follows:

$$TA_{it}/GDP_{it-1} = \alpha_1 + \alpha_3 1/GDP_{it-1} + \alpha_2 (\Delta_{REV_{it}} - F7REC_{it})/GDP_{it-1} + \alpha_3 (N_FA_{it}/GDP_{it-1}) + \varepsilon_{it} \quad (5)$$

where

- TA_{it} , the dependent variable, is total accruals in terms of ESA/EDP accounts in year t for firm i , calculated as the differences among net lending/borrowing (DEFICIT) reported in EDP Table 2 for each country and the operating working balance
- $\Delta_{REV_{it}} \mp F7REC_{it}$ – revenues in year t less revenues in year $t - 1$ for subsector i less the time adjustment related to the accounts receivable
- N_FA_{it} (net financial assets), measures the financial position for each subsector over time and the related impact on unmanageable interest flow.

We assume that revenues are NDAs because of their strong link with the economic cycle and the taxation system, as also supported from several studies by the European Commission.

N_FA_{it} replace the PPE for a twofold reason. First, the dimension of countries' PPE is unreliable in light of the never-ending debate about fair estimations of heritage assets and the availability of updated information about instrumental fixed assets (Biondi et al., 2021); second, for EDP reconciliation purposes only N_FA and related changes are available. Moreover, we assume that N_FA and related changes are linked with the economic cycle and country dimension with no room for manipulations.

From these reasoning emerge that all the other items included in the EDP reconciliation process can be subjected to some kind of manipulations and, when this possibility is confirmed, they belong to the discretionary accruals (DAs).

In order to find empirical evidence, we developed a two-stage model. First (model a, for testing H1), as a measure of earnings management, we use the DAs, estimated as the residual (ε_{it}) of the regression equation (5). According to previous literature, positive discretionary accruals (+DAs) are associated with positive manipulations (net lending increase or net borrowing decrease) while negative discretionary accruals (–DA) are associated with negative manipulations (net lending decrease or net borrowing increase). However, considering the case of a country that negatively manipulates the same item, by departing from the same amount, for two consecutive years, if the second manipulation is less negative than the first, this would mean that the country is reducing its role of negative manipulator. For this reason, in the second stage (model b, for testing H2), considering that the absolute value of discretionary accruals ($|DA|$) represents the net magnitude of manipulations, we detect the relationship between the positive manipulation (DA+) and the negative one (DA–), in order to capture the effective behaviour on average and for each country.

The models built are expressed by the following equations:

- Model a

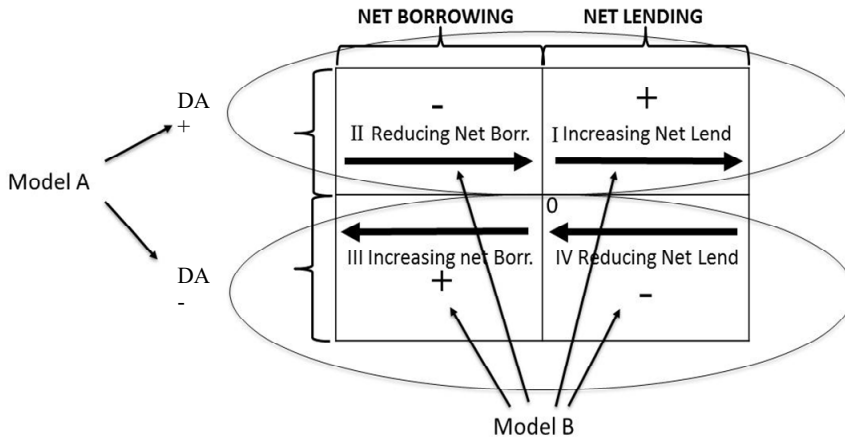
$$DA_{it} = \alpha_0 + \alpha_1 NF_TR_{it} + \alpha_3 F7REC_{it} + \alpha_4 F7PAY_{it} + \alpha_5 SD3_ADJ_{it} + \alpha_6 OTH_ADJ_{it} + d1_{it} + d2_{it} + d3_{it} + i \cdot Area_{it} + \varepsilon_{it}$$

- Model b

$$|DA_{it}| = \alpha_0 + \alpha_1 NF_TR_{it} + \alpha_3 F7REC_{it} + \alpha_4 F7PAY_{it} + \alpha_5 SD3_ADJ_{it} + \alpha_6 OTH_ADJ_{it} + d1_{it} + d2_{it} + d3_{it} + i \cdot Area_{it} + \varepsilon_{it}$$

Figure 1 provides a graphical explanation of the models described.

Figure 1 The empirical model for testing earnings manipulation



Source: Authors' elaboration

Table 1 Variance inflation factors

Variable	VIF	1/VIF
nf_tr	1.17	0.854898
f7rec	1.21	0.829826
f7pay	1.11	0.904514
oth_adj	1.13	0.884632
sd3_adj	1.11	0.900378
dummy_1	1.34	0.747553
dummy_2	1.44	0.694276
dummy_3	1.01	0.986607
Area		
Local	1.9	0.526206
Social	2.58	0.388269
State	1.09	0.919177
Mean VIF	1.37	

Source: Authors' elaboration

With the aim of avoiding multicollinearity and producing robust estimations, we removed *OTH_ADJ*, even though it was held to make interactions with dummy variables for which the problem was absent. For the same reason the interaction between *d2* and other variables was removed. Finally, we removed *EDP_D41_DIF* because of a huge lack of these data in the panel. Table 1 shows the variance inflation factor (VIF) excluding the variables removed. As notable, the results for all the other variables are consistent to the aim of avoiding multicollinearity.

For the purposes of the research, each observation i of all proposed equations and models are referred to each government subsector.

Finally, three dummies were added to the model: dummy $d1_{it}$ assumes 1 if the working balance declared in EDP Table 2 is accrual-based, 0 otherwise. This variable controls the incentive to manipulate earnings that could arise as a consequence of the strong difference between GA and NA rules. $d2_{it}$ assumes 1 if the country x in year n had a net surplus, 0 otherwise. This variable controls for potential incentives to manipulate earnings towards a better fiscal stance. At last, $d3_{it}$ assumes 1 if the national institute of statistics of a country has received a visit from Eurostat during the year of observation and Eurostat gave some advice or observed problems in terms of accrual transaction recognition during the EDP reconciliation process, 0 otherwise. This variable draws the attention to a possible decrease or increase in manipulating some items when a country is under inspection.

Interaction variables_{it} test the interaction between dummies and any other variable included in the model.

4 Findings

4.1 Descriptive statistics

Table 2 shows descriptive statistics for each variable, whereas Tables 3, 4 and 5 and the related Figures 2, 3 and 4 show the DA and TA distribution for each year, country and government subsector.

Concerning Table 2, the analysis carried out shows a negative value for the working balance on average and a very low weight of financial transaction. TA are positive on average and DA are close to 0. With regard to table 3, the amount of TA is often negligible; while for 18 countries out of 28 DA are, on average, negative during the time-span considered. Positive DAs are associated with positive earnings manipulation, the opposite when the DA are negative. Italy represents a compelling case and an outlier at the same time. It has both DA (average 2.1 and maximum value 27.3) and TA strongly positive. This means Italy was the country with the highest manipulation incidence. Malta and Spain report the greatest negative manipulation (−0.586 and −0.487 respectively). When moving to investigate the issue of manipulation across government sub-sector, social security funds report the greatest positive DA (approx. 0.2) in a context where the other sub-sectors negatively manipulated, while the greatest TA is registered in the central governments (approx. 0.4) in a context where only local governments made, on average, negative manipulation (approx. −0.1).

Table 2 Descriptive statistics

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
TA	1,133	0.184	1.958	-11.539	33.479	-0.005	0.000	0.003
DA	1,133	0.000	1.724	-18.727	27.302	-0.196	0.009	0.055
nf_tr	761	-0.001	0.006	-0.102	0.039	0.000	0.000	0.000
f7rec	1,133	0.031	0.345	-2.321	6.383	0.000	0.000	0.001
f7pay	1,133	-0.018	0.371	-5.112	3.957	-0.001	0.000	0.000
oth_adj	1,133	-0.030	0.544	-10.187	5.412	-0.001	0.000	0.000
sd3_adj	949	0.000	0.012	-0.123	0.206	0.000	0.000	0.000
dummy_1	895	0.166	0.373	0.000	1.000	0.000	0.000	0.000
dummy_2	1,133	0.394	0.489	0.000	1.000	0.000	0.000	1.000
dummy_3	898	0.471	0.499	0.000	1.000	0.000	0.000	1.000
workbal	1,133	-0.633	5.275	-95.901	4.767	-0.013	0.000	0.002
edp_b9	1,133	-0.557	4.710	-92.800	5.454	-0.016	-0.001	0.002
revenue	1,133	0.181	0.112	0.000	0.921	0.095	0.162	0.261
Deltarev_F~C	1,133	-0.023	0.345	-6.359	2.331	0.001	0.005	0.012
financiala~s	1,133	0.168	0.154	0.000	0.800	0.038	0.106	0.279
financialli~s	1,133	0.302	0.424	0.000	2.524	0.018	0.085	0.484
netfinanci~s	1,133	-0.134	0.341	-2.004	0.621	-0.233	-0.001	0.026
otherrecei~e	1,133	2.814	110.283	-1,708.406	3,239.086	-0.070	0.095	1.130

Source: Authors' elaboration

Table 3 Discretionary and total accruals per year

<i>Year</i>	<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
2002	DA	58	-0.098	0.341	-1.075	0.615	-0.214	0.004	0.059
	TA	58	-0.002	0.012	-0.049	0.018	-0.004	0.000	0.002
2003	DA	60	-0.146	1.204	-7.298	4.532	-0.174	0.017	0.082
	TA	60	0.191	2.278	-4.550	16.946	-0.005	-0.001	0.001
2004	DA	59	0.183	1.970	-3.841	13.714	-0.112	0.015	0.076
	TA	59	0.260	2.224	-5.871	14.504	-0.005	0.000	0.002
2005	DA	58	0.175	1.089	-1.101	6.028	-0.044	0.022	0.077
	TA	58	0.355	1.554	-0.082	7.838	-0.003	0.000	0.002
2006	DA	60	-0.213	2.648	-18.727	7.755	-0.044	0.028	0.090
	TA	60	0.205	1.443	-2.775	8.641	-0.004	0.000	0.003

Note: DA-TA distribution per year. DA and TA distribution for each year, from 2002 to 2020, showing minimum and max value, mean, median, standard deviation and percentile 25 and 75.

Source: Authors' elaboration

Table 3 Discretionary and total accruals per year (continued)

<i>Year</i>	<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
2007	DA	56	0.029	1.259	-5.966	5.266	-0.080	0.029	0.077
	TA	56	0.178	1.435	-3.136	9.542	-0.006	0.000	0.002
2008	DA	59	0.039	1.682	-7.818	9.599	-0.060	0.021	0.069
	TA	59	0.141	2.170	-9.369	12.899	-0.005	0.000	0.001
2009	DA	54	0.169	1.998	-1.225	14.420	-0.142	0.003	0.030
	TA	54	0.302	2.257	-0.223	16.575	-0.006	0.000	0.005
2010	DA	57	-0.077	0.574	-2.144	3.112	-0.138	-0.003	0.037
	TA	57	-0.001	0.672	-3.440	3.660	-0.006	-0.001	0.002
2011	DA	58	-0.074	0.450	-0.937	2.543	-0.208	-0.010	0.036
	TA	58	0.109	0.969	-0.960	7.295	-0.006	0.000	0.004
2012	DA	58	-0.127	0.821	-3.704	4.421	-0.339	-0.018	0.025
	TA	58	0.111	0.601	-0.093	3.270	-0.004	0.000	0.003
2013	DA	63	0.159	3.788	-11.447	27.302	-0.224	-0.009	0.041
	TA	63	0.389	4.496	-11.539	33.479	-0.005	0.000	0.003
2014	DA	63	-0.042	2.328	-10.939	14.072	-0.257	-0.007	0.042
	TA	63	0.280	3.371	-9.883	24.536	-0.002	0.000	0.003
2015	DA	63	-0.065	2.219	-11.189	12.807	-0.261	0.005	0.039
	TA	63	0.093	1.942	-9.205	11.720	-0.005	0.000	0.002
2016	DA	63	0.069	1.318	-1.534	9.668	-0.259	0.001	0.052
	TA	63	0.124	0.752	-0.150	5.384	-0.005	0.000	0.002
2017	DA	62	0.205	2.147	-1.637	16.299	-0.200	0.011	0.058
	TA	62	0.336	2.027	-0.059	15.450	-0.003	0.001	0.005
2018	DA	62	-0.048	0.542	-1.585	2.314	-0.225	0.012	0.063
	TA	62	0.082	0.486	-0.318	3.596	-0.002	0.001	0.004
2019	DA	60	0.028	1.015	-1.622	6.569	-0.232	0.015	0.059
	TA	60	0.227	1.561	-1.692	11.277	-0.003	0.000	0.003
2020	DA	60	-0.161	0.529	-2.074	1.386	-0.359	0.012	0.056
	TA	60	0.114	1.164	-2.078	8.723	-0.008	0.000	0.009
Total	DA	1,133	0.000	1.724	-18.727	27.302	-0.196	0.009	0.055
	TA	1,133	0.184	1.958	-11.539	33.479	-0.005	0.000	0.003

Note: DA-TA distribution per year. DA and TA distribution for each year, from 2002 to 2020, showing minimum and max value, mean, median, standard deviation and percentile 25 and 75.

Source: Authors' elaboration

Table 4 Discretionary and total accruals by country

<i>Country</i>	<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
Austria	DA	35	-0.288	0.304	-0.759	0.037	-0.565	-0.438	0.032
	TA	35	-0.001	0.012	-0.027	0.050	-0.003	0.000	0.001
Belgium	DA	16	-0.070	0.246	-0.992	0.017	-0.024	-0.013	0.005
	TA	16	0.001	0.010	-0.024	0.024	-0.001	0.001	0.002
Croatia	DA	12	-0.470	0.076	-0.628	-0.358	-0.513	-0.461	-0.407
	TA	12	-0.006	0.015	-0.032	0.016	-0.017	-0.004	0.005
Cyprus	DA	56	-0.172	0.656	-1.405	0.677	-0.846	-0.002	0.419
	TA	56	-0.018	0.072	-0.338	0.072	-0.001	0.000	0.001
Czech Republic	DA	56	0.012	0.098	-0.234	0.157	0.011	0.024	0.080
	TA	56	-0.001	0.008	-0.049	0.016	-0.001	0.000	0.001
Denmark	DA	52	0.011	0.082	-0.226	0.113	-0.041	0.006	0.078
	TA	52	-0.001	0.008	-0.034	0.025	0.000	0.000	0.000
Estonia	DA	49	0.097	0.135	-0.042	0.438	0.021	0.039	0.065
	TA	49	0.000	0.005	-0.025	0.014	0.000	0.000	0.000
Finland	DA	18	-0.149	0.106	-0.265	0.069	-0.257	-0.168	-0.074
	TA	18	0.001	0.021	-0.024	0.068	-0.010	-0.006	0.009
France	DA	56	-0.191	0.296	-0.945	0.076	-0.418	-0.033	0.024
	TA	56	-0.003	0.011	-0.019	0.033	-0.014	-0.002	0.003
Germany	DA	74	-0.087	0.150	-0.354	0.069	-0.236	0.014	0.043
	TA	74	0.000	0.005	-0.018	0.024	-0.001	0.000	0.001
Greece	DA	57	-0.372	0.677	-2.074	0.233	-1.012	0.002	0.108
	TA	57	-0.007	0.021	-0.125	0.052	-0.007	-0.004	0.000
Hungary	DA	57	-0.161	0.290	-0.719	0.095	-0.471	0.019	0.037
	TA	57	0.000	0.015	-0.063	0.044	-0.002	0.001	0.006
Ireland	DA	19	-0.355	0.298	-0.762	0.103	-0.579	-0.439	-0.042
	TA	19	-0.008	0.052	-0.206	0.061	-0.013	0.002	0.009
Italy	DA	53	2.103	7.596	-18.727	27.302	-0.937	2.314	4.532
	TA	53	3.992	8.242	-11.539	33.479	-0.223	3.270	7.295
Latvia	DA	53	-0.002	0.114	-0.352	0.141	-0.060	0.030	0.083
	TA	53	-0.001	0.009	-0.030	0.025	-0.005	-0.001	0.003
Lithuania	DA	35	-0.015	0.070	-0.246	0.056	-0.045	0.016	0.026
	TA	35	-0.001	0.015	-0.077	0.028	-0.003	0.000	0.003
Luxembourg	DA	56	0.180	0.129	0.010	0.402	0.042	0.181	0.298
	TA	56	-0.008	0.021	-0.081	0.027	-0.010	-0.001	0.004

Note: DA-TA distribution by Country. DA and TA distribution for each year, from 2002 to 2012, showing minimum and max value, mean, median, standard deviation and percentile 25 and 75.

Source: Authors' Elaboration

Table 4 Discretionary and total accruals by country (continued)

<i>Country</i>	<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
Malta	DA	19	-0.586	0.313	-1.159	-0.200	-0.927	-0.478	-0.374
	TA	19	0.004	0.013	-0.036	0.023	-0.003	0.005	0.013
Netherlands	DA	54	-0.106	0.165	-0.426	0.053	-0.297	-0.012	0.008
	TA	54	-0.001	0.042	-0.097	0.272	-0.008	-0.003	0.001
Poland	DA	38	-0.130	0.185	-0.460	0.099	-0.303	-0.078	0.040
	TA	38	-0.008	0.012	-0.045	0.005	-0.014	-0.002	0.000
Portugal	DA	57	-0.241	0.423	-1.247	0.183	-0.543	-0.044	0.087
	TA	57	0.013	0.022	-0.008	0.124	0.001	0.005	0.018
Romania	DA	56	0.023	0.131	-0.332	0.415	-0.009	0.027	0.066
	TA	56	0.003	0.006	-0.012	0.018	-0.001	0.002	0.005
Slovakia	DA	54	-0.062	0.174	-0.526	0.150	-0.113	0.018	0.036
	TA	54	0.000	0.010	-0.036	0.035	-0.002	0.000	0.001
Slovenia	DA	52	-0.033	0.110	-0.470	0.055	-0.006	0.004	0.020
	TA	52	-0.002	0.007	-0.050	0.005	-0.001	0.000	0.000
Spain	DA	13	-0.487	0.162	-0.816	-0.263	-0.577	-0.514	-0.315
	TA	13	-0.019	0.015	-0.059	0.004	-0.023	-0.016	-0.014
Sweden	DA	36	0.062	0.215	-0.475	0.325	-0.090	-0.016	0.276
	TA	36	-0.008	0.027	-0.048	0.075	-0.024	-0.012	0.001
Total	DA	1,133	0.000	1.724	-18.727	27.302	-0.196	0.009	0.055
	TA	1,133	0.184	1.958	-11.539	33.479	-0.005	0.000	0.003

Note: DA-TA distribution by Country. DA and TA distribution for each year, from 2002 to 2012, showing minimum and max value, mean, median, standard deviation and percentile 25 and 75.

Source: Authors' Elaboration

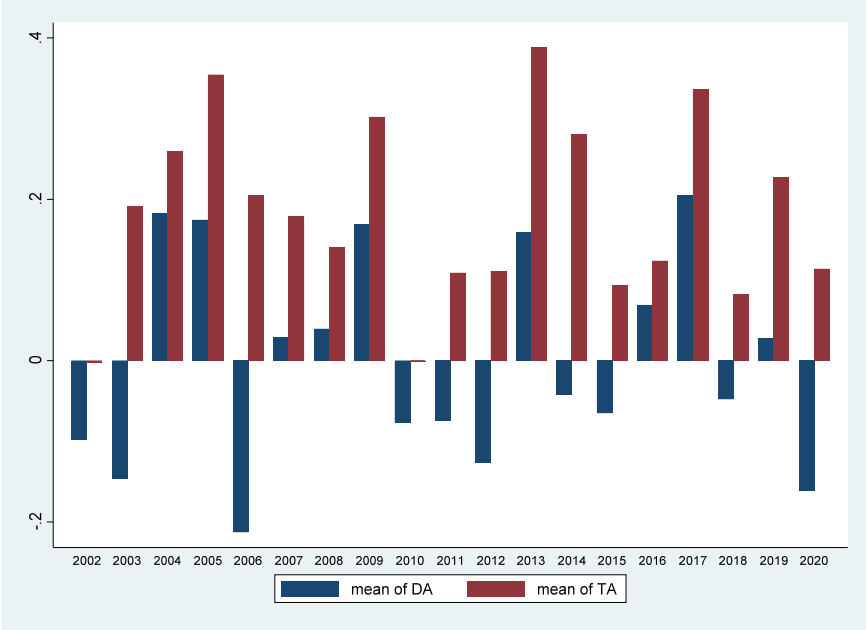
Table 5 Discretionary and Total Accruals by Government Subsector

<i>Area</i>	<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
Central	DA	445	-0.076	2.416	-18.727	27.302	-0.527	-0.297	-0.056
	TA	445	0.419	2.747	-3.136	33.479	-0.012	0.000	0.008
Local	DA	336	-0.084	1.380	-11.447	7.755	-0.006	0.017	0.045
	TA	336	-0.105	1.358	-11.539	8.641	-0.003	0.000	0.001
Social	DA	320	0.202	0.600	-2.681	5.266	0.027	0.047	0.167
	TA	320	0.181	0.999	-0.787	9.542	-0.001	0.000	0.004
State	DA	32	-0.072	0.062	-0.146	0.017	-0.131	-0.102	-0.013
	TA	32	0.001	0.007	-0.024	0.024	-0.001	0.001	0.002
Total	DA	1,133	0.000	1.724	-18.727	27.302	-0.196	0.009	0.055
	TA	1,133	0.184	1.958	-11.539	33.479	-0.005	0.000	0.003

Note: DA and TA distribution for each year, from 2002 to 2020, showing minimum and max value, mean, median, standard deviation and percentile 25 and 75.

Source: Authors' elaboration

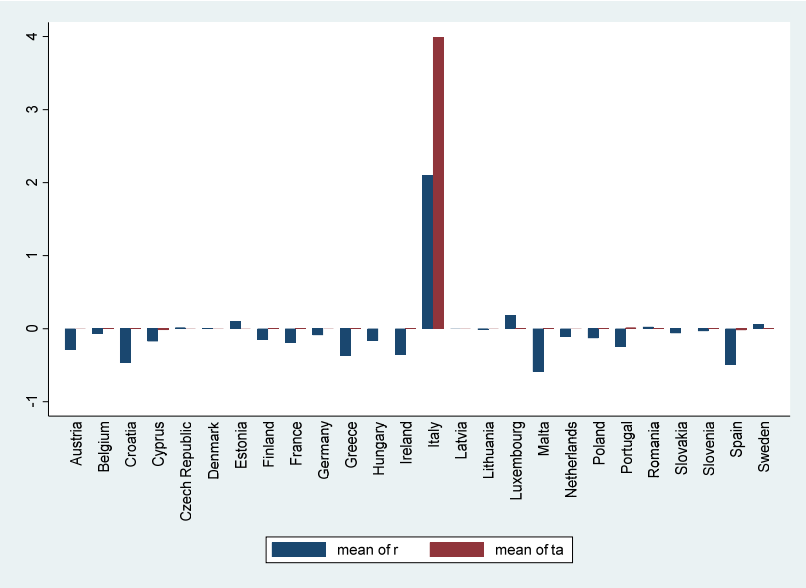
Figure 2 Discretionary accruals and total accrual in the period 2002–2020 (see online version for colours)



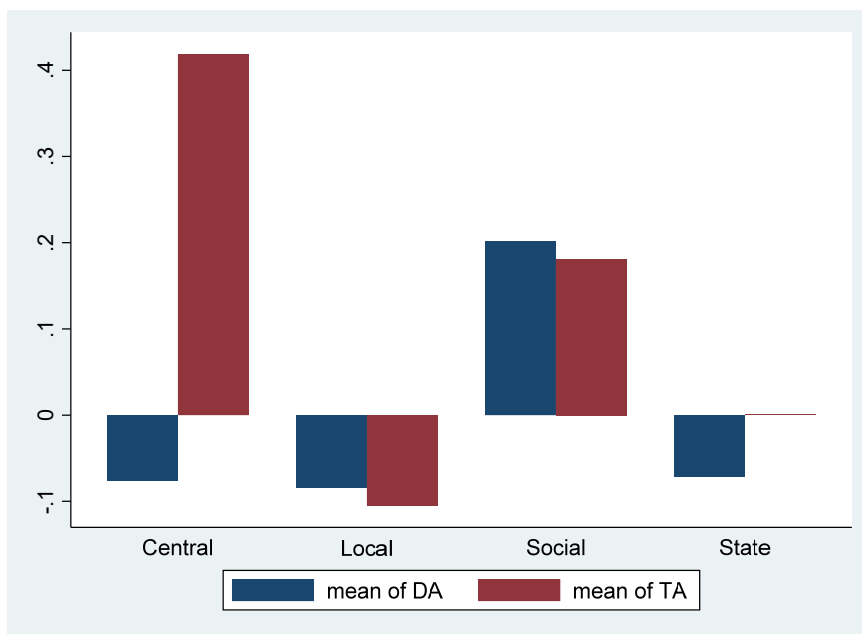
Note: DA – discretionary accruals; TA – total accruals.

Source: Authors' elaboration

Figure 3 Discretionary accruals and total accruals by country (see online version for colours)



Source: Authors' elaboration

Figure 4 Discretionary accruals and total accruals by sectors and subsectors (see online version for colours)

Source: Authors' elaboration

4.2 Evidence from the regression models

Table 6 summarises the results of our models.

The relationship between F7PAY, F7REC the DA is always negative, which means that those items were, on average, negatively manipulated decreasing the net lending or by increasing the net borrowing. F7REC made exception to the reported behaviour where all dummies and interactions were taken into account (see model 4/a). This could be explained by considering that depending on the GA framework, more or less aggressive/conservative revenue recognition policy can be putted in practice during the EDP reconciliation process. In depth, when the working balance is totally or mainly accrual-based, there is further room for positive manipulations; on the contrary when the working balance is mainly cash based is hard to positive manipulate revenues and the related accounts receivables. Thus, the change in the number of observations and the departing accounting framework would explain the reversal in model 4 about F7REC coefficient.

Opposite evidence is given by NF_TR, SD3_ADJ and OTH_ADJ, even if the latter loses its statistical significance when the model took into account the government sub-sectors separately. More narrowly, these items were positively manipulated. Regarding the dummies, it comes out that only d1 and d2 play a role in the manipulation, while country visits from Eurostat (d3) do not play any significant role. The full model clearly shows that manipulations have occurred within each government sub-sector and the positive coefficient witnesses that, on average, accounts were positively manipulated. Thus, the basic hypothesis (H1) finds confirmation (Jones, 1991; Dechow et al., 1995). It

is worthwhile to note that these evidences are not in contrast with what reported within descriptive statistics. A positive manipulation does not mean that DAs were positive. Differently, it means that they could be positive or less negative over the time.

Table 6 Evidence from the two regression models

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
	<i>DA (a)</i>	<i>DA (a)</i>	<i>DA (a)</i>	<i>DA (a)</i>
NF_TR	5.103*** 12.27	4.694*** 11.07	4.679*** 10.67	1.789*** 5.77
F7REC	-2.698** (-3.01)	-5.545*** (-7.29)	-5.236*** (-5.53)	1.413* 2.07
F7PAY	-8.229*** (-7.30)	-5.492*** (-4.68)	-4.797** (-3.10)	-2.773* (-2.55)
OTH_ADJ	2.386*** 5.27	2.241*** 4.79	2.415*** 5.05	0.162 0.47
SD3_ADJ	12.00*** 20.91	11.37*** 19.05	11.10*** 18.13	5.439*** 12.61
DUMMY_1		0.00441 0.67	0.00447 0.65	-0.0245*** (-4.49)
DUMMY_2		0.0272*** 4.47	0.0295*** 4.64	0.0101* 1.99
DUMMY_3			-0.00348 (-0.58)	-0.00261 (-0.62)
Central				0 (.)
Local				0.217*** 36.7
Social				0.242*** 32.83
State				0.0733*** 5.07
Constant	0.0243*** 8.44	0.00406 0.93	0.00357 0.65	-0.199*** (-40.45)
Observations	668	542	517	517
Adjusted R-squared	0.491	0.54	0.525	0.846

Note: *, **, *** denote significance levels at 0.1, 0.05, and 0.01.

Source: Authors' elaboration.

Table 6 Evidence from the two regression models (continued)

	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
	<i>DA_abs (b)</i>	<i>DA_abs (b)</i>	<i>DA_abs (b)</i>	<i>DA_abs (b)</i>
NF_TR	2.554*	3.110*	3.310**	2.665*
	2.28	2.56	2.7	2.32
F7REC	5.018	3.692	7.025	-2.129
	1.43	1.08	1.66	(-0.63)
F7PAY	0.748	1.177	11.24	-8.042
	(-0.16)	(-0.21)	(-1.53)	(-1.25)
OTH_ADJ	-11.05**	-10.50**	-10.97**	-6.295
	(-3.29)	(-2.73)	(-2.87)	(-1.86)
SD3_ADJ	-2.666	-0.141	-0.44	1.158
	(-1.27)	(-0.06)	(-0.19)	-0.62
DUMMY_1		-0.0471**	-0.0380*	0.0181
		(-2.86)	(-2.19)	1.36
DUMMY_2		-0.107***	-0.0996***	0.00687
		(-6.48)	(-5.81)	0.62
DUMMY_3			-0.0229	-0.0165
			(-1.30)	(-1.16)
Central				0
				(.)
Local				-0.333***
				(-15.12)
Social				-0.280***
				(-10.92)
State				-0.242***
				(-10.39)
Constant	0.140***	0.200***	0.199***	0.366***
	-17.24	-12.63	-10.34	-14.74
Observations	669	542	517	517
Adjusted R-squared	0.097	0.164	0.186	0.466

Note: *, **, *** denote significance levels at 0.1, 0.05, and 0.01.

Source: Authors' elaboration.

When moving to models from 5b to 8b where DAs are considered in modules, magnitudes and the directions of manipulations become clearer. First of all, the only two variables that keep the role of 'manipulators' are NF_TR and OTH_ADJ (even if, on the same wavelength of model 4a, the significance disappears when all dummies and interactions were considered in the model). This evidence reinforces the interpretation of the scarce power of the European Institutions in controlling National Accounts for the so-called 'out of balance or off balance transactions'. Notwithstanding the continuous

recommendations of the European Commission to not undertake una-tantum transactions, they exist, and they seem out of control by the so-called preventive arm.

Countries adopting negative manipulations (DA−) are more (18 out of 28) and have more weight than those make positive manipulations. However, the impressive positive manipulation made by Italy leads to the conclusion that the main behaviour was in favour of better fiscal stance than the actual ones, confirming H2. Obviously, this interpretation would be totally reversed by excluding Italy from the sample. It is not a secret that during the considered time-span several countries (above all the PIIGS) had their public finance in trouble waters. Moreover, the enforced surveillance provided by the European Commission should have determined a strong reduction of opportunistic behaviours aimed at improving the fiscal stance. It is curious to detect that while four out of five PIIGS made weak or moderate negative manipulations, Italy was the only country, among PIIGS and in absolute, which made the greatest and positive manipulations. This issue, perhaps, can be clarified by investigating year by year the off-balance measures undertaken by the Italian Government, especially during the year of the sovereign debt crisis (2008–2011).

Thus, the analysis carried out suggests that the manipulations are mainly positive (DA+) with the aim to reduce the net borrowing or to increase the net lending (Jorge and Laureano, 2014; Jorge and Jesus, 2015; Jorge et al., 2016, 2018). By the way, considering that in the years under investigation most of the countries had a negative fiscal stance, we can conclude that the positive manipulation was enforced toward a deficit reduction. Especially to not exceed the 3% deficit/GDP Maastricht threshold established to avoid an EDP procedure opening by the European Commission.

5 Discussion: pros. and cons. of accrual accounting application to the public sector

Summing up the evidence, we report that the adoption of accrual accounting enhances the possibility to put in action manipulations practices because a certain degree in flexibility emerge in the reconciliation process from GA to NA. The potential negative effects of the accrual accounting application to the public sector are not new (Anessi-Pessina and Sicilia, 2020; Bisogno and Donatella, 2021; Dabbicco, 2013; Ferreira et al., 2013; Shi, 2016). Different reasons were brought from scholars to support this viewpoint (Bonollo, 2022). It is clear that the issue does not arise because the solely accrual accounting application and/or transposition into the public sector. The issue is a more or less complex result of interactions with other variables retrievable into the different settings where the accrual basis is applied (i.e., central government, higher education institutions, healthcare organisations, etc.).

At the end of the journey, three are the main differences that enable manipulations during the reconciliation process:

- 1 off-balance transactions;
- 2 other adjustment differences;
- 3 difference in consolidation financial statements areas and requirements.

Indeed, H1 is confirmed. In particular, selected items show positive and strong significant regression coefficients that allow us to assume that accounting manipulations widely exist across Europe during the conversion process. This evidence is confirmed whatever the GA framework used by countries. Moving to model b, the results confirm that the direction of the manipulation is positive and mainly due to the NF_TR items. Anyway, as highlighted, estimators are affected by the presence of a huge outlier as Italy, which weight affects the reliability of the results. For this reason, H2 is weaker confirmed witnessing that off balance transactions have the main responsibility of actions aimed at reducing the net borrowing or increasing the net lending (Koen and van den Noord, 2005). Further studies could detect if manipulations are driven by the status of countries under the EDP procedure.

Only in 2002 and 2010 the manipulation, on average, was negative. In the first case, it might be a consequence of the launch of the new common currency (euro), or due to the great attention by the media all around the world to NA in that year. In the second case, the first reform of the code of conduct (other updates were released in 2008 and 2011) for the preparation of the stability and convergence programmes, and the higher flexibility allowed by the European Commission for those countries in financial troubles could explain the evidence.

As a whole, evidence achieved suggest a final and decisive acceleration in the harmonisation procedure between accounting frameworks with the aim of enhancing transparency, financial accountability, and to get reliable data about the fiscal stance of EU members (Mussari and Sorrentino, 2017). Regarding each item, among those used for manipulation purposes, we can retrieve other following useful insights:

- 1 SD3_ADJ is a variable that measures the incentive to manipulate earnings deriving from shortcomings among countries concerning the perimeter of consolidation and way to conduct the consolidation process. If the disclosure of the accounts for the GGS and other subsectors were to be positively judged because it enhances the transparency within a given country, the weakness of the consolidated process (Bergmann, 2014; Bergmann et al., 2015; Pina et al., 2009) could undermine the reliability of the working balance used as a starting point for the NA process. In particular, entities that are partially under control from GGS or other subsectors could adopt behaviours aimed at manipulating their results, especially when consolidation rules have a certain degree of freedom in their application (Gardini and Grossi, 2014). Moreover, as stressed in the literature (Grossi, 2016; Santis et al., 2018), a clear and shared legal framework about consolidated financial statements of state-owned enterprises (SOEs) and other similar entities within the GGS needs to be addressed in the short term with the aim to avoid opportunistic behaviour within the same countries with a huge different rule among subsectors.
- 2 OTH_ADJit are a series of reclassifications deriving from the strong differences between GA and NA standards. Theoretically, those differences should not determine DA. Notwithstanding, according to Dabbicco (2013), some NA standards escape from a pure full accrual logic, generating adjustments even for countries that adopt the full accrual basis of accounting for government accounts (i.e., time recognition, revenue recognition, etc.)

- 3 F7RECit and F7PAYit are two of the most traditional items used in the private sector to smooth earnings. These behaviours seem to persist with regard to the public sector and more enforced by the adoption of GA accrual-based. What remain unclear are the reasons behind the systematic negative manipulation found in the study.

Finally, there is need to align the consolidation areas among and within subsectors and to erase the possibility to manage some items 'off-balance'. Eurostat is called to enforce its monitoring activity and to improve its collaboration with the single National Statistics Institute.

6 Conclusions and implication for further research

The differences between GA and NA have increasingly drawn scholars' attention over time. This paper attempts to adapt models used in the private sector (Jones, 1991; Dechow et al., 1995) aimed at measuring dangerous practices, such as different types of accounting manipulations, to the public sector. The risk of manipulation in public sector arises especially from the existence of the so-called Maastricht threshold that obliges EU countries to maintain their net borrowing and the net debt under the 3% and 60% of GDP respectively (unless authorised deviations agreed from EU to countries).

The results confirm that accounting manipulations exist and that they have a wider diffusion across European countries, especially those under EDP procedures and in trouble waters. We find out that manipulations, on aggregate, were positive. However, this is mainly due by the single outlier represented by Italy, which is at the same time a compelling case and a study limitation.

This evidence recalls the necessity to align as much as possible the existing micro (GA) and macro (NA) accounting frameworks. At least for EDP tables preparation made from the Statistical National Institute of each country. The use of accrual accounting, which has been strongly recommended in recent years, does not seem to completely address the issue. As highlighted among scholars, the full accrual basis of accounting is not always applied in the preparation of EDP tables because this could push the net borrowing well beyond the deficit threshold established by the Maastricht Treaty. This is particularly verified for countries whose GA rules are strongly different from NA ones and for those who are historically very close or beyond the thresholds (as PIIGS countries in the recent past). Hence, the policy makers have to face the challenge of harmonisation in a definitive manner.

Hence, from the institutional and technical standpoints, avenues for future research emerge, namely:

- 1 A test of the actual relationship among European fiscal needs and accrual accounting, especially during the exogenous (for instance the COVID-19 pandemic or the war in Ukraine) and endogenous (for instance the sovereign debt crisis) financial crises, in order to understand how accrual accounting might be useful to implement and control fiscal policies and the sustainability of public finance (Plummer and Patton, 2015).
- 2 A balanced recourse to 'tailor-made' public accounting standards, for each Member State, in compliance with other European institutional levels (Biondi and Soverchia, 2014; Mussari and Sorrentino, 2017).

As recently stressed by some scholars (Kim and Wang, 2015; Modlin and LaShonda, 2014; Plummer and Patton, 2015; Shi, 2016), there are many tools, in and out the accounting field, used by public administrations and governments to recover/hide shortfalls or deficit in their accounts. However, the existence of different frameworks for producing accounts and making fiscal policies could foster opportunistic behaviours both from preparers and politicians, as demonstrated in this study.

According to García (2014), standardisation and accounting convergence is not the only cornerstone of public administration accounts improvement. That is why the issue, many times, has debated more under the political point of view (Bello and Spano, 2015; Buchanan, 2009; Ferreira et al., 2013; Guarini, 2016; Stalebrink and Donatella, 2021) than technical one (Bergmann et al., 2015, 2019; Brusca and Martínez, 2016; Dabbicco, 2013; Eulner and Waldbauer, 2018).

Further research should be aimed at testing this model over time and in different contexts to enhance its reliability. In addition, researches regarding real activities' manipulation in the European context are welcome. As noted, elections' proximity, financial distress and political connections represent fields of investigation that, in our opinion, should be taken seriously into account in order to study in depth the extent of accounting manipulations in the public sector.

Finally, it is remarkable to recall that manipulations have their origins not in connection with the application of the accrual accounting but the accounting framework used might strongly affect the magnitude of manipulations, as demonstrated in this study.

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