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Creative Accounting: A Process for Finance Ministers to Influence Governments' Financial Performance. Evidence from Swiss Cantons

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Creative Accounting: A Process for Finance Ministers to Influence Governments' Financial Performance. Evidence from Swiss Cantons

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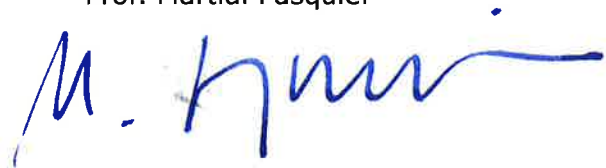
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Fleurier. *L'équilibre parfait.*
Après des amortissements supplémentaires de 96 834 francs,
les comptes bouclent à 0 franc.

Source: L'Express, le 27 juin 2007. *"La conjoncture, les péréquations et l'or de la BNS embellissent les comptes"*

Contents

Abbreviations and acronyms

List of cantonal acronyms

AG	Aargau	NW	Nidwalden
AI	Appenzell Innerrhoden	OW	Obwalden
AR	Appenzell Ausserrhoden	SG	St. Gallen
BE	Bern	SH	Schaffhausen
BL	Basel-Landschaft	SO	Solothurn
BS	Basel-Stadt	SZ	Schwyz
FR	Fribourg	TG	Thurgau
GE	Genève	TI	Ticino
GL	Glarus	UR	Uri
GR	Graubünden	VD	Vaud
JU	Jura	VS	Valais
LU	Luzern	ZG	Zug
NE	Neuchâtel	ZH	Zürich

List of acronyms related to econometrics

OLS	Ordinary Least Squares
2SLS	Two Stage Least Squares
3SLS	Three Stage Least Squares
PCSE	Panel Corrected Standard Errors
REGAR	First Order Autoregressive
VIF	Variance Inflation Factor

List of other acronyms

APS	Année Politique Suisse
BADAC	Banque de données des cantons et des villes suisses
CDF	Conférence des Directeurs Cantonaux des Finances
FFA	Federal Finance Administration
FKF	Fachgruppe für Kantonale Finanzfragen
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product
HAM	Harmonized Accounting Model for Swiss cantons and municipalities
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
IPSAS	International Public Sector Accounting Standards
NAM	New Accounting Model for the Swiss Confederation
SECO	State Secretariat for Economic Affairs
SFSO	Swiss Federal Statistical Office

1 Introduction

Fiscal transparency is probably the most important notion in accounting in both private and public sectors. Accounting is supposed to provide various stakeholders with a transparent and reliable picture of the firms' and governments' financial situation. For the public sector, this is at least the theory supported by the International Public Sector Accounting Standards Board (IPSASB) when it presses governments to report their financial performance and position in a true and fair view.[1]

Nonetheless, accounts may be manipulated through creative accounting, which refers to *"a process whereby accountants use their knowledge of accounting rules to manipulate the figures reported in the accounts of a business"* (Amat et al. 1999). At the same time, Baralexis (2004) asserts that the main characteristic of creative accounting is the discretionary nature of those operations. Indeed, in the author's point of view, *"creative accounting is the process of intentionally exploiting or violating the GAAP or the law to present financial statements according to one's interests"*.[2] Although both definitions account for the private sector, the same can be said for the public sector. That way, if accounts are effectively manipulated through creative accounting, the objective of fiscal transparency is no longer achieved. Subsequently, it becomes more difficult for stakeholders to take efficient decisions. Without any doubt, consequences ensuing from such manipulations may be highly damaging. Notably, the current European Monetary Union crisis demonstrates the danger of such practices.

However, in spite of such incontestable evidence, we support that, in certain circumstances, creative accounting can have beneficial effects on the governments' financial performance. In any case, this is the first element we investigate in this research. Throughout this research, we aim to quantify the impact of creative accounting on the level of public deficits.

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[1]The IPSAS (International Public Sector Accounting Standards) norms are recommendations, published by the IPSAS Board, intended for the presentation of accounts in the public sector. They are based on the IFRS (International Financial Reporting Standards) and on the IAS (International Accounting Standards). The IPSAS norms apply to every public entity (central government, subnational level of government and municipality), with the exception of public firms that principally have a commercial activity.

[2]The GAAP (Generally Accepted Accounting Principles) refer to the standard framework of guidelines for financial accounting used in any given jurisdiction. That way, GAAP are a codification of how firms have to prepare and present their financial statement (incomes, expenses, assets and liabilities). In a large part of jurisdictions, GAAP ensue from the International Financial Reporting Standards (IFRS) developed by the International Accounting Standards Board (IASB).

The second element we investigate is the various determinants of creative accounting, paying particular attention to the extent to which finance ministers matter to this issue. To answer both research questions, we concentrate on the 26 Swiss cantons and the 116 finance ministers in position over the period 1980 - 2012.

In most Swiss cantons, the individual cantonal legislation usually requires the statement of financial performance to be balanced (or almost balanced). In other words, the total operating expenses, which are the total costs of the publicly provided services, have to be integrally covered by the operating revenues. This means that Swiss cantons have to report surpluses during booms in order to offset past or future public deficits. Swiss cantons are thus implicitly recommended to run a structural surplus to avoid the risk of reporting a deficit during economic downturns. Additionally, knowing that finance ministers have personal interests in sound public finance, they are expected to be all the more liable to embrace such a budgetary policy. Since they are assessed by voters on their capacity to ensure fiscal soundness (i.e. avoid public deficits and thus growing indebtedness), it is essential for finance ministers to save surpluses over time. However, in practice, it is relatively hard for governments and thus for finance ministers to justify a surplus. Indeed, it would indicate that taxes paid by citizens were too high compared to the usual public services they received from the government. Conversely, it would signify that governments failed to provide adequate public services compared to the tax revenues they received. Claims from citizens or political parties (spending ministers or deputies) aiming to reduce taxes or to increase public spending may then appear from such situations. Such an evidence has notably been revealed on March 2005 by La Gruyère, a local newspaper of the canton of Fribourg. Commenting the financial results of the year 2004, the newspaper wrote *"As soon as published, the surplus of the canton of Fribourg, for the year 2004, aroused envy. At first, the Social Democratic Party (PS) tries to grasp the godsend and claims for tax reductions for middle-class families yet in 2006 [...]"*.[3]

In order to avoid those claims, finance ministers may have strong incentives to artificially reduce the surplus reported in the statement of financial performance as opposed to presenting a true and fair representation. On top of allowing the use of additional depreciation

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[3]Source: La Gruyère (22.05.2005) Le bénéfice attise les envies

charges, cantonal legislation also gives the possibility to finance ministers to play with special funds in order to disguise reported figures. However, accounting has to be used to present the financial situation as it is in reality and its use should not deviate from this objective. Accounting should not be employed to transform reality in order to ultimately satisfy particular interests. But additional depreciation charges and special funds are used exactly in this way. They are purely and simply budgetary tools used by finance ministers with the sole purpose of misleading financial information users. For that reason, we will consider additional depreciation charges and special funds as creative accounting throughout this research.

However, although they are untrue and unfair and thus degrade the representation of reality, additional depreciation charges and special funds are legal in Swiss cantons. That way, as cantonal public accounts are validated in the light of cantonal legislation, their utilization is not forbidden. Finance ministers therefore have all the latitude they want to shape the reported balance of the statement of financial performance according to their personal interests. Concretely, they are legally authorized to publish the picture that best suits their own objectives. Moreover, due to their legality, additional depreciation charges and special funds are even reported in public accounts. Cunningly, the finance minister even displays them and communicates that, after additional depreciation charges and the setting aside of special funds, the surplus is, for instance, about 1 million CHF. As proof, dedicating an article to the annual reported accounts of Fribourg, Le Temps, a national newspaper, read in 2009 that *"for the seventh consecutive year, the canton gathers a surplus, which officially came up to only 29.6 millions CHF. But without provisions, mandatory or not, and additional depreciation charges, the real amount would rather be about 180 millions CHF"*.[4] Comparatively, the online 20 Minutes journal, ran the title *"The canton of Valais is finally ready to cope with the coming crisis. It carried out reserves and additional depreciation charges in 2008. [...]. In spite of these measures, balances in 2008 remain positive and highlight an excess of revenues of 0.5 million CHF"*.[5] Moreover, finance ministers may even confess they discretionarily use additional depreciation charges and special funds regarding the financial situation. Investigating reported amounts of reserves, provisions and additional depreciation

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[4]Source: Le Temps (03.04.2012) Septième compte positive de suite pour Fribourg
[5]Source: 20 Minutes (06.04.2009) Le Valais financièrement prêt à affronter la crise

charges, La Gruyère wrote that the finance minister of Fribourg *"ends up adminiting that about ten million would not have been used the way they were in case of a deficit"*.[6]

By budgeting additional depreciation charges or uncommon allocations to special funds, finance ministers increase operating expenses, which justify maintaining higher tax rates than necessary. In turn, these high tax rates generate additional cash-flow that allows the constitution of reserves and/or the repayment of debt. Both accruals would thus be used in the sole purpose to maintain fiscal pressure on citizens and to avoid political claims for higher public spending. As a consequence, by restraining the level of operating expenses and by simultaneously guaranteeing higher operating revenues, creative accounting should improve the future governments' financial performance. The first research question of this essay therefore investigates the relationship between creative accounting and the balances of the statement of financial performance.

Then, due to their discretionary characteristics, additional depreciation charges are basically considered as a budgetary policy tool controlled by finance ministers. Similar evidence is also given in regards to special funds. Although the resort to such practices is supposed to be first tightly linked to the economic situation, it also appears reasonable to argue that finance ministers could impose their own trademarks on the use of creative accounting. Depending on their personal characteristics, we cannot rule out that the resort to such accounting tricks could vary between finance ministers. The second research question tackled in this essay is therefore devoted to the determinants of creative accounting operations in Swiss cantons. More specifically, in addition to testing the influence of the cantonal financial situation, we assess whether the finance ministers' political ideology, experience, as well as educational background account for their decision to resort to creative accounting.

Different approaches are performed in order to answer both research questions. Firstly, a qualitative analysis is carried out in order to provide preliminary evidence regarding our subject of interest. The qualitative analysis relies on the participation of nine experts of Swiss public finance and of the twenty-six cantonal finance administrations.

Secondly, regarding the impact of creative accounting on the governments' financial per-

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[6]Source: La Gruyère (22.05.2005) Le bénéfice attise les envies

formance, two different estimation strategies are used. The first strategy consists in a single equation model where the balance of the statement of financial performance (surplus or deficit) is the dependent variable. In order to take some particularities of our data set into account and to ensure the robustness of our results, five different estimators are employed to run this first model. They are the Ordinary Least Squares (OLS), the Linear Regression with first order autocorrelation (REGAR) developed by Baltagi and Wu (1999), the Panel Corrected Standard Error (PCSE) developed by Beck and Katz (1995), the Two Stage Least Square (2SLS) and the Generalized Method of Moments (GMM) notably presented by Arellano and Bover (1995). Then, the second model to be tested is a simultaneous equations model where the level of operating revenues and the level of operating expenses are estimated simultaneously. Several reasons explain why we adopt this estimation strategy. Among all of our reasons, we have to bear in mind that the balance of the statement of financial performance is by definition the difference between the operating revenues and the operating expenses. The simultaneous equations model allows us to assess the impact of particular determinants of the governments' financial performance through their respective influence on either revenues, expenses or eventually both. This methodology provides a better comprehension and more detailed information as to the mechanisms determining the level of public balances. Moreover, as it is hypothesized, we argue that creative accounting operations influence both operating revenues and operating expenses. The advantage and also the justification of this second approach is to disentangle the respective effects of creative accounting operations on revenues and expenses. In order to run this second model, we perform the Three State Least Square (3SLS) estimator developed by Zellner and Theil (1962).

Thirdly, two different estimation strategies are also considered in order to investigate the influence of the finance ministers' personal characteristics in the use of creative accounting. The first one, which relies on linear regressions, aims to determine the level of creative accounting operations reported in cantonal statements. To do so, we employ four different econometric estimators that are the Ordinary Least Squares (OLS), the Linear Regression with first order autocorrelation (REGAR), the Panel Corrected Standard Error (PCSE) and

the Tobit estimator. Next, the second estimation strategy devoted to the determinants of creative accounting is based on logistic regressions. In that case, through the use of logit and probit estimators, we aim to investigate the probability of Swiss cantons resorting to creative accounting operations.

This research comprises several scientific and practical implications. The first implication concerns the explanation of the governments' financial performance. In general, this study could be used to inform authorities about the phenomena influencing public deficits and consequently the level of debt. By highlighting factors affecting the level of operating revenues and operating expenses and therefore the balance of the statement of financial performance, results obtained through both estimation strategies should allow to formulate recommendations about measures to be adopted in order to curb public deficits. We thus expect that these results will provide insightful and reliable information, that could be used by cantonal governments in order to improve their financial situation.

The second implication concerns the budgetary policies implemented in Swiss cantons. Indeed, this research may also be considered as an assessment of budgetary policy embraced by cantonal governments over the last three decades as results ensuing from this analysis will determine whether additional depreciation charges and operations on special funds have had the expected effects on the governments' financial performance. Since the introduction of the first harmonized accounting guidelines for cantons and municipalities (HAM1), Swiss cantons have been widely encouraged to play with additional depreciation charges in order to repay debt. Moreover, strong evidence has shown that special funds have been used, at least partially, to serve the same purpose. However, as yet, whereas no proof has been provided as to the influence of such accounting practices on the level of public debt, Swiss cantons have largely based their budgetary strategy on those practices. Consequently, through our results, we will demonstrate whether such accounting tricks have had the expected influence on the governments' financial performance. Therefore this study will be a means to endorse or to blame the budgetary strategy embraced by Swiss cantons.

A third implication, in addition to validating or invalidating cantonal budgetary strategies, this will be the first time that the phenomenon of creative accounting is tackled when studying

Swiss cantons. Moreover, it will also be the first time that this phenomenon is quantified. By measuring the amounts reported as additional depreciation charges and as special funds in the statement of financial performance, we will provide an accurate estimation of the phenomenon in Swiss cantons for the first time. Simultaneously, as we have amounts to be assimilated to creative accounting as well as the reported balances of the statement of financial performance, we will measure the corrected balances. In other words, we will highlight what the governments' financial performance would have been if Swiss cantons had not resorted to creative accounting during the investigated period.

The fourth implication is scientific and concerns the measurements of creative accounting. By concentrating on amounts reported in the cantons' statements of financial performance, we will deal with criticisms notably formulated by Dechow and Skinner (2000) and Dechow and Dichev (2002). While most of the researchers (e.g. Healy 1985; DeAngelo 1986; Jones 1991) generally use more or less sophisticated econometric methodologies to statistically separate the discretionary and non-discretionary part of accruals in order to measure the phenomenon of creative accounting, Dechow and Skinner (2000) and Dechow and Dichev (2002) argue that those sophisticated estimations do not represent a fair view of the reality. According to these authors, such methodologies do not provide a good measurement of creative accounting. Consequently, measuring directly in the statement of financial performance the amounts of additional depreciation charges and special funds that are discretionary manipulated in Swiss cantons allows us to avoid these criticisms.

The fifth justification concerns the essence of creative accounting. While in most of the literature devoted to the public sector it is demonstrated that creative accounting is used to artificially conceal public deficits without having any structural incidence on the governments' net equity, we provide strong evidence that the opposite may occur. Indeed, in this essay, we sustain and investigate that reporting a surplus in the statement of financial performance may also lead to creative accounting by public authorities. As explained above, creative accounting is used in Swiss cantons in order to prevent the dissolution of surpluses. The constitution of cookie-jar reserves through the resort to creative accounting is expected to structurally improve the cantonal fiscal soundness over time. That way, whereas creative

accounting may usually be seen as a corrective action, in our particular case, we assert that its use is preventive. Since this vision of creative accounting has never been discussed before, it constitutes an important research innovation.

The sixth implication relies on the second research question. By investigating the determinants of creative accounting, we will simultaneously deepen the quasi-nonexistent literature related to finance ministers. Whereas it is commonly recognized that finance ministers have to be distinguished from spending ministers as they play a particular role in government, only few empirical evidence has been provided so far. Therefore, even though our study pays attention to a particular case in a particular context, namely the extent to which finance ministers matter in the use of additional depreciation charges and special funds in Swiss cantons, it will give food for thought regarding the importance of those ministers in government. Simultaneously, we will indirectly demonstrate who the finance ministers are who matter for the governments' financial performance since we hypothesize that creative accounting structurally affects public balances. This latter element is not insignificant in regard to the lack of scientific evidence provided by the literature.

Finally, in addition to representing an interesting context of investigation for the creative accounting phenomenon, Swiss cantons are a relevant panel to study in the field of public finance. Due to their number, the twenty-six Swiss cantons offer an extraordinary diversity as to the analysis of public sector financial management. This diversity mainly relies on federalism, which provides the Swiss cantons with a large degree of financial and budgetary autonomy. Furthermore, the differences between cantons may also be sensed through their size; whether it is in terms of financial size or in terms of population. That way, while studying Swiss cantons offers all the advantages of international comparisons regarding the richness of the data, it also avoids drawbacks inherent to such comparisons. Indeed, Swiss cantons are easily comparable since they share the same institutional framework given that they are members of the same confederation. They use the same accounting handbook and currency. And at the same time, the information needed to conduct such empirical research is gathered in a small number of databases, which is not always true at an international

level.[7]

Regarding the structure of this essay, the remainder of the paper is organized as follows. In Section 2, we provide an exhaustive account of existing literature devoted to creative accounting. In order to better comprehend the phenomenon, we devote our attention to both private and public sectors. To that purpose, we define *what* creative accounting is and explain *why* and *how* it is practiced by both private firms and public entities. Simultaneously, we put empirical contributions as well as normative and positive theories relative to public deficits in perspective. Then, the literature review closes by providing evidence of the role played by finance ministers, in particular through their personal characteristics, in a government.

In Section 3, we reach the heart of the problem by depicting the context in which creative accounting occurs in Swiss cantons. Concretely, we present actors associated to the budgeting process and aim at highlighting various stakes surrounding accounting and financial information.

After having formulated preliminary considerations regarding the budget process, we provide in Section 4 a discussion relative to the influence of creative accounting on the governments' financial performance. At the same time, we tackle as precisely as possible the extent to which cantonal finance ministers matter for the use of creative accounting as precisely as possible. In addition to offering a general discussion regarding both research questions, we also formulate the hypothesis to be tested through the empirical analysis.

Then, the current research being particularly technical from a pure accounting point of view, we believe it is necessary to dedicate a whole section to the main accounting elements surrounding this research. That way, in Section 5, we give a detailed description of the accounting guidelines employed in Swiss cantons since the early 1980s. In particular, we highlight why the HAM1 does not offer a true and fair view of the governments' financial situation and thus how it differs from the IPSAS norms. This notably demonstrates why additional depreciation charges and operations on special funds have to be assimilated to creative accounting.

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[7] In Switzerland, the information needed to perform such research is mainly available through the Swiss Federal Statistic Office (SFSO), the Federal Finance Administration (FFA), the State Secretariat for Economic Affairs (SECO) and the Conference of Cantonal Finance Ministers (CDF). Nevertheless, when the needed information is not centralized at national level, it may be obtained through the cantonal finance administrations.

Section 6 relies on diverse descriptive statistics in order to provide a detailed overview of the quantitative importance of creative accounting in Swiss cantons. While we first present the amounts reported as additional depreciation charges and special funds, we then propose a corrected version of the balances of the statement of financial performance. This offers an insight regarding the impact of creative accounting on the governments' financial performance. Additionally, we have to underline that finance ministers are for a large part responsible for the use of accounting gimmicks in Swiss cantons. To do so, we crossreference the data relative to additional depreciation charges and special funds with those relative to the finance ministers. In other words, we report the amounts of creative accounting with regard to the finance ministers' political ideology, experience as well as educational background.

Afterward, we report qualitative information ensuing from a survey conducted through interviews with nine experts in the field of local public finance and by questionnaires answered by the 26 cantonal administrations of finance. The object of Section 7 is primarily to validate our hypothesis and to bring elements of response. Moreover, this survey is expected to provide food for thought regarding the discussion of the explanation of public deficits and creative accounting operations in Swiss cantons.

For their part, Sections 8 and 9 both deal with empirical analysis. Whereas in Section 8 the goal is to measure the impact of additional depreciation charges and special funds on governments' financial performance, the goal of Section 9 is to tackle the determinants of these creative accounting operations. As for their content, both sections are identically structured. For each empirical analysis, the set of variables used as well as the different estimation strategies are presented. Following the methodological part, a detailed presentation of the results is presented to the reader. Both sections are concluded with a summary and a discussion about the results.

Finally, Section 10 is devoted to the conclusion. In this last section, we remind ourselves the objectives and stakes of this research. Then, the main results are briefly summarized before being put into perspective.

2 Literature review

In the current section, we first offer a detailed overview of the literature devoted to creative accounting in both private and public sectors with the objective to answer three questions: What? Why? How?[8] In other words, we gather definitions and explain the incentives firms and governments may have in embracing such accounting practices. And at the same time, without claiming to be exhaustive, we report accounting tricks commonly used and assimilated to creative accounting. A large part of the current section is then dedicated to the normative and positive theories of public deficits. Finally, we terminate by investigating the role played by politicians and especially finance ministers in the management of public policies; the underlying idea being to provide relevant clues regarding their influence in the use of creative accounting. As a whole, the purpose of this section is to give the broadest picture of the existing literature paying attention to our fields of interest in order to highlight the knowledge gap and ultimately to justify our research questions.

2.1 Creative accounting in the private sector

It is probably when Enron Corporation collapsed, in the 90's, that the terms of creative accounting, earnings management or yet window-dressing became publicly known. Behind those terms are hidden a lot of definitions. But the broadest picture is certainly provided by Healy and Wahlen (1999) who read that *"earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers"*. Other authors have also formulated their own definition, as Schipper (1989) who considers earnings management as *"the strategic exercise of managerial discretion in influencing the earnings figure reported to external audiences"*. Amat et al. (1999) meanwhile have defined earnings

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[8]Today, accounting principles governing the public sector are strongly inspired by those of the private sector. Indeed, IPSAS norms are an almost thoroughly transposition of the IFRS, which rely on accrual accounting instead of cash accounting. Whereas accrual accounting was expected to improve transparency, it simultaneously gave more freedom to accountants in order manipulate firms financial statements. That way, in addition to share the same tools, private and public sectors henceforth share the same illness: the creative accounting. Consequently, the literature devoted to this phenomenon being older and larger for the private sector, it appears all the more relevant to take this literature into account in order to understand the importance and the stakes of such a practice in the public sector.

management as *"a process whereby accountants use their knowledge of accounting rules to manipulate the figures reported in the accounts of a business"*. And Gowthorpe and Amat (2005) to add that *"creative accounting refers to the fact that financial statements are manipulated by financial managers"*. Earnings management would therefore have to be considered as a process consisting in disguising reported figures through accounting gimmicks. Nonetheless, Naser and Pendlebury (1992) goes further in arguing that *"creative accounting is the transformation of financial accounting figures from what they actually are to what preparers desire by taking advantage of the existing rules and/or ignoring some or all of them"*. And adding that *"creative accounting is a process of modifying the operating results, away from (revealing) the actual picture and towards the desirable results"*. In the light of the former assertion, it appears reasonably arguable that managers would enjoy personal benefits in modifying reported figures. Indeed, already in 1989, Schipper underlines that *"earnings management is a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gains"*. Then, Gowthorpe and Amat (2005) highlight of the key elements of creative accounting when they touch upon the legal framework in which it occurs by formulating that creative accounting is *"the use of accounting to mislead rather than help the intended users by deliberately taking advantage of areas where there are ambiguities"*. In addition, as Healy and Wahlen (1999) do, hints are also given by authors that creative accounting would be used since managers would not share similar interests with various stakeholders. Ambiguities regarding the perimeter delimiting creative accounting to fraud have also been discussed by Dechow et al. (2010) who emphasize that *"earnings management [represents] earnings manipulations that are both within and outside the bounds of GAAP"*. Previously Baralexis (2004) also confirmed that *"creative accounting is the process of intentionally exploiting or violating the GAAP or the law to present financial statements according to one's interests"*. And to Boškin (2005), who cites an accountant, to precise that *"GAAP are flexible and leave much space for subjectivity in the evaluation, which leaves a broad maneuvering space for manipulations, fraud and bias"*. As a proof, Bitner (2005) reports that the custom is *"if GAAP reporting doesn't put the firm in the proper light, find a reporting method that does!"*. Nonetheless, Merchant and Rockness (1994) warn that earnings

management *"provides no true economic advantage to the organization and may, in fact, in the long-term, be detrimental"*.

Creative accounting and earnings managements would therefore be discretionary accounting manipulations taking place within or outside the GAAP and aiming at achieving personal interests by deceiving stakeholders. Nonetheless, no consensus have appeared to be reach so far regarding the boundaries delimiting the phenomenon of creative accounting. For Davidson et al. (1987), earnings management is *"a process of taking deliberate steps within the constraints of [GAAP]"*. Although he agrees with the former definition, Brown (1999) precises that *"management reporting actions that are taken outside the bounds of GAAP [...] constitute fraud"* and so cannot be considered as earnings management. And conversely, Beneish (1999), for his part, considers earnings management as *"an instance in which a company's managers violate GAAP"*. Thus, earnings management operations should be considered as fraudulent. Finally, Stolowy and Breton (2004) satisfy themselves with mentioning that *"accounts manipulation is not fraud. It is a matter of interpretation which leads to a financial position and results that are not a fair representation of the reality"*. The discussion dealing with the delimitation between accounting manipulations and fraud not being closed, it would seem we are most often in a gray area where there are no specific standards and where concepts need to be interpreted to provide policy guidance (Shah 1998). This highlights the discretionary nature of creative accounting, which is at the center of the debate.

Moreover, behind these accounting manipulations are hidden different objectives. Whereas it is generally sustained that the resort to creative accounting allows to disguise reported figures, Copeland (1968) precises that creative accounting may aim at maximizing, minimizing or smoothing reported earnings. Consequently, there are several kinds of earnings management. Among these practices, the two most dealt with in literature are income smoothing and big bath accounting.

When paying attention to income smoothing, Schipper (1989) and also Stolowy and Breton (2004) indicate that it is a particular form of creative accounting that aims to reduce the volatility of reported earnings. Copeland (1968) specifies that income smoothing moderates year to year fluctuations in reported incomes by shifting earnings from peak years to less

successful periods. Barnea et al. (1976) and Beattie et al. (1994) then respectively report that firms smooth in order to achieve *"some level of earnings that is currently considered to be normal for the firm"* or *"towards an expected level of reported earnings"*. Firms and their managers would therefore have incentives to manage earnings and so to smooth incomes over time. Suh (1990) underlines that income smoothing is an attempt to fool the various stakeholders by presenting them with more stable earnings over time. Doing this would provide various advantages. First of all, presenting smoothed and increasing earnings over the years would allow the market to easily predict the future of the firm (Beattie et al. 1994). The firm would thus be perceived as less risky by the markets (Herrmann and Inoue 1996; Hillier and McCrae 1998) and would ultimately endure lower borrowing costs (Hepworth 1953; Zucca and Campbell 1992). Secondly, Moses (1987) provides evidence that American firms enjoy higher share value when they achieve forecasts. Thirdly, managers and shareholders could also enjoy some private gains from smoothed reported incomes. Indeed, as revealed by several authors (Beidleman 1973; Moses 1987; Beattie et al. 1994; Hillier and McCrae 1998) smoothed earnings would allow managers and shareholders to respectively receive more constant bonuses and dividends when those elements evolve in line with reported earnings. Finally, smoothing earnings could allow firms to avoid some political costs. For instance, Craig and Walsh (2006) but also Moses (1987) mention that companies may face wage claims from employees if they report unusually high profits. Firms may also risk losing public subsidies, facing higher taxes or falling into the scrutiny of regulators by reporting higher profits (Craig and Walsh 2006; Herrmann and Inoue 1996).

A wide range of accounting devices are at the manager disposal in order to smooth reported figures of private companies. The resort to extraordinary items reclassification is an efficient way to do so (Ronen and Sadan 1975; Godfrey and Jones 2002; Barnea et al. 1976; Beattie et al. 1994). Consisting in recording extraordinary items above the line during good years in order to reduce reported earnings, managers may register current items below the line in order to report higher earnings during hard financial times. Craig and Walsh (2006) demonstrate that larger Australian firms are more prompt to resort to income smoothing through the use of extraordinary items. Herrmann and Inoue (1996) have shown that Japanese firms

smooth earnings through changes in depreciation methods. Firms also have the possibility to record additional depreciation charges, to play with the depreciation rate or to perform large asset write-downs (Hillier and McCrae 1998; Hepworth 1953; Craig and Walsh 2006; Zucca and Campbell 1992). Lybaert et al. (2005) reveal that Belgian companies, between 1997 and 2002, tended to smooth earnings by increasing or decreasing provisions. Moreover, it has been demonstrated by Walsh et al. (1991) and also Beneish (1999) that Australian and American companies played with inventory valuation to dampen the fluctuations of earnings over time. Cookie-jar reserves have also been revealed as an efficient device allowing managers to offset lower incomes (Bernstein 1970; Healy and Wahlen 1999). Indeed, such funds allow firms to establish reserves in a thriving economy that will be used in bad economic times. More generally, Moses (1987) mentions that firms may use all accounting charges in general, namely accruals, to achieve this goal. And Moore (1973) to add that *"future income would be relieved of those charges"*, which facilitates the reporting of increased earnings in the following years. Then, Barnea et al. (1976), and more recently Lybaert et al. (2005), point out that playing with the time to perform certain transactions or with an event's occurrence and recognition could be a tool at the firms disposal. Finally, Walsh et al. (1991) precise that creative accounting may be performed through the combination of all these elements.

Although a large range of literature be devoted to income smoothing, detailed attention has also been given to big bath accounting. First of all and according to Walsh et al. (1991), big bath accounting refers to a specific *"managerial stratagem"*. More precisely, big bath accounting may be viewed as a concept consisting in discretionarily aggravating deficits, in a particular year, when results are already bad in order to report a bigger deficit (Stolowy and Breton 2004; Lybaert et al. 2005). Interestingly enough, Moore (1973) shows in his contribution that such events specifically occurred in US companies during changes in management. Such practices would allow to attribute poor results to the former direction according to Stolowy and Breton (2004). Furthermore, as firms may enjoy economic advantages (e.g. borrowing at lower costs on capital markets) if they report constant increasing earnings over time, they might be tempted to undertake a big bath (Zucca and Campbell 1992). Indeed, taking the bath allows companies to have *"a reduction in the benchmark for future's earn-*

ings" (Kinney and Trezevant 1997). It therefore becomes easier to present a rapid increase in earnings. Zucca and Campbell (1992) also argue that it is a good way to inform *"the markets that bad times are behind"* and to once again enjoy some economic advantages. Authors then reveal that big bath accounting principally occurs through asset write-downs. Such operations consist in decreasing the book value of an asset when this value is higher than the market value. It is considered as earnings management because managers are suspected of choosing the year to perform it at their own discretion. Finally, authors highlight that tools used to undertake a big bath are the same as those used to smooth earnings; i.e. the accruals that are easily manipulable since they do not generate cash-flows.

2.2   Creative accounting in the public sector

Creative accounting is not only a private sector practice. Indeed, evidence has been provided that creative accounting is also a common phenomenon in the public sector. Notably, definitions embracing a public sector perspective have been more recently formulate. For instance, Koen and van den Noord (2005) stipulate that *"creative accounting refers to the more or less unorthodox treatment of operations involving the general government"*, and add that it *"may reflect opportunistic accounting"*. In the light of this definition, governments seem, as in the private sector, to use discretion in order to manipulate, to not say violate, accounting rules. Then, Milesi-Ferretti and Moriyama (2006) consider creative accounting as *"fiscal operations improving budgetary figures but having no structural incidence on government finance"*. In other words, Easterly (2001) says that *"creative accounting may be viewed as fiscal adjustments that lower the budget deficit or public debt but leave government net worth unchanged"*. Moreover, Milesi-Ferretti (2004) specifies that creative accounting does *"not increase the government net worth even if [it] improve[s] fiscal balance!"*.

Over the past forty years, most countries have experienced large public deficits and important debt accumulation. And in most cases, subnational levels of governments have suffered the same phenomenon. In such circumstances and in order to avoid taking unpopular decisions and facing the risk of not being re-elected, governments may be tempted to use

some fiscal gimmicks instead of resolving their structural financial problems. Petersen (2003) demonstrates that U.S. states and localities that are facing fiscal distress resort to creative accounting in order to hide deficits. Nonetheless, U.S. states are not alone in facing such a situation. Large amounts of evidence support that European Union (EU) countries resorted to accounting manipulations, notably during the run-up for the European Monetary Union (EMU) integration. The reason is that countries had to respect two objectives in order to get into the EMU, the so-called Maastricht criteria. First, the annual government deficit must not exceed 3% of the Gross Domestic Product (GDP). Second, the gross debt must not exceed 60% of GDP.

Milesi-Ferretti and Moriyama (2006) and also Balassone et al. (2007) highlight that EU countries artificially reduced their deficits and indebtedness in order to achieve Maastricht criteria, without increasing their net worth.[9] By using a balance sheet approach, Milesi-Ferretti and Moriyama (2006) reveal that the change in public debt was strongly positively correlated with the change in government assets. In other words, between 1992 and 1997, EU countries decreased the level of their debt thanks to a reduction of public assets. Authors have then found that this relation disappeared after 1997, i.e. after the EU countries got into the EMU. Von Hagen and Wolff (2006) draw the same conclusion. Furthermore, Balassone et al. (2007) take an interest in showing that EU countries probably manipulated their deficits since they highlight that the reported balance were not reflected in the change in debt during the run-up for EMU integration. In spite of the simplicity of their model, they argue that a mere comparison of deficit and changes in debt can help the early detection of inconsistencies in fiscal data. Moreover, Prammer (2009) explains that some EU countries performed privatizations and outsourcing in order to reduce public debt. The author questions whether or not such practices, aiming at recording expenditure off the books, constitutes creative accounting. Indeed, the answer may depend on the interpretation of the European System of Accounts (ESA 95). During the same period, Montesinos and Vela (2000) or Benito et al. (2008) pay particular attention to the use of creative accounting in Spain. During the run-up for the EMU integration, Spain principally used Private Financing of Infrastructure and Pub-

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[9]Some authors argue that this notion should be preferred to both EMU criteria as it reflects the financial health of a country. And also, they argue that this notion is less malleable.

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lic Private Partnership in order to maintain the level of capital expenditure whilst achieving the Maastricht criteria. Results also highlight that Spain had recourse to fiscal gimmicks such as the German Method, deferred payments, extension of concession term limits or decentralization of public debt.[10] Without qualifying those methods as illegal, authors wonder whether they are strictly legal. Indeed, according to their point of view, it is the lack of clear accounting standards on how to report those means that allowed governments to do this. Again, as in the private sector, we are in a gray area where there are no specific standards and where concepts need to be (discretionarily) interpreted to provide policy guidance (Shah 1998).

From the foregoing, we might assume that it is the political cost of not getting into the EMU that led countries to use creative accounting. Nevertheless, it has been expressed by some authors that fiscal rules may partly explain the occurrence of accounting manipulations aiming at disguising reported balances. For instance, Milesi-Ferretti (2004) notes that *"the incentives to use nonstructural fiscal measures - often described as creative accounting - may increase in the presence of fiscal rules"*. Particularly in Europe, as pointed out by Buti et al. (2007), creative accounting appeared with the introduction of the Stabilization and Growth Pact (SGP), which includes the Maastricht criteria.

Initially, fiscal rules were introduced in the public sector at both national and subnational levels of governments in order to restrain deficits and debt (Bohn and Inman 1996; Feld and Kirchgässner 2008; Bodmer 2012). Nonetheless, various evidence tends reveal that fiscal rules would not be an effective way of improving the government's financial position over time. For instance, Fatás and Mihov (2006), who pay special attention to U.S. states, show that fiscal policy would be more pro-cyclical in the presence of budget constraints. Such a fiscal policy would lead to higher deficits and indebtedness as governments would not accumulate reserves during times of economic growth, which would help them offset the effects of downturns. Moreover, Kopits and Craig (1998) warns that states may have the incentive to use creative accounting practices to circumvent these kinds of rules. Evidence

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[10]The German method is a method consisting in paying building and interest costs of an infrastructure to the bidder only when the work is accomplished. Therefore, during the building period, the government does not bear neither budgetary expenses or borrowing costs, which allows it to achieve EMU criteria more easily (Benito et al. 2008).

of this concern is given by Von Hagen (1991), who reads that U.S. states achieved budget constraint targets with the aid of accounting manipulations. Indeed, his results highlight that fiscal restraints induced U.S. states' governments to implement off-budget activities, in particular. And, at the same time, Drazen (2002) suggests that the more binding a rule is, the more it would give incentive to resort to creative accounting practices. Then, although Luechinger and Schaltegger (2011) demonstrate that fiscal rules significantly allowed Swiss cantons to restrain the occurence of public deficits, they conclude by mentioning that they cannot rule out that, at least partially, deficits have been reduced through creative accounting operations or window-dressing measures. Finally, Milesi-Ferretti (2004) summarizes as follows: if governments satisfy fiscal rules by using cosmetics, it implies that, in reality, there is a deficit. Fiscal rules would thus be ineffective to put deficit and debt under pressure. However, on another hand, the author points out that *"the existence of a margin for creative accounting also implies that the budget retains some ability to respond to cyclical shocks even in the presence of a numerical budget rule"*.

Again, although Canova and Pappa (2006) agree on the fact that U.S. states use creative accounting to reach fiscal targets, they also assume that those states have other legal devices to do so. Wagner and Sobel (2006) note that, during the 1980s, there was a rush of states adopting budget stabilization funds, commonly known as rainy day funds. In their research, authors bring out that the adoption of such funds coincides with the introduction of the Tax and Expenditure Limit laws (TELs), the U.S. states' fiscal constraints. It therefore appears, as hinted by authors, that rainy day funds would have been adopted in order to always have the capacity to reach objectives stated by fiscal rules.

As described by Grizzle (2010), rainy day funds are reserves in which *"money is saved when state finances are healthy for use during economic downturns"*. In other words, Gonzalez and Paqueo (2003) mention that *"rainy day funds allow states to smooth public spending over time by saving during booms and using the balance to cover revenue shortfalls during recessions"*. Rainy day funds would thus have the advantage of facilitating the governments' implementation of counter-cyclical budget policies *"without having to alter [their] long-run revenue and expenditure policy"* (Navin and Navin (1994)). To summarize, rainy day funds

allow governments to alleviate volatility of public spending and revenue. Nonetheless, the balances of rainy day funds are rarely sufficient to offset revenue shortfalls. That way, policymakers have two possibilities. Either they may proceed to increase taxes in order to maintain the level of public spending constant over time, or they may proceed to public spending cuts in order to obtain public spending equivalent to the sum of tax revenues and rainy day funds and so, finally, to reach a balanced budget. Evidence has been provided that rainy day funds allow U.S local governments to smooth fiscal balances (Gonzalez and Paqueo 2003; Wagner and Sobel 2006; Grizzle 2010). Moreover, and logically enough, Hendrick (2006) reveals that U.S municipalities that have higher rainy day funds better face economic downturns. Then, Grizzle (2010) specifies that smoothing incomes also allows governments to be perceived as less risky by capital markets. That way, as in the private sector, showing more stable fiscal balances would allow states to borrow at a lower cost. However, the effectiveness of rainy day funds would largely depend on their rules of deposit and withdrawal. Indeed, Sobel and Holcombe (1996) demonstrate for instance that rainy day funds are more effective to cope with fiscal rules when they have more stringent saving rules. Nevertheless, Pattison (2012) warns that even rainy day funds are put under pressure by politicians and citizens when they attain a relatively large size.

As previously indicated, states may have to respect budget constraints (e.g. balanced budget rules). The economic theory also suggests that countries should perform a counter-cyclical budgetary policy. To do this, governments should therefore accumulate savings during good years in order to offset the impact of economic downturns. Besides, this point of view is supported by Alesina (2000) who pleads that governments should keep tax rates constant in order to maximize the social welfare.[11] That way, if tax rates are constant, temporary deficits are expected to occur during recessions or periods of exceptionally high spending. Conversely, surplus should be the rule during economic expansions.

Nevertheless, this is rarely how things happen. During bad years, states always resort to tax increases or spending cuts to dampen the importance of deficits. Therefore, some fringes of the population may bear some loss of welfare because of those tax increases and spending

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[11]This argument was first assumed by Lucas and Stokey (1983).

cuts. Anthony (1985) then expresses that even if deficits are badly perceived, surpluses are not better viewed by politicians and citizens. Whereas a deficit indicates that the state does not live within its means, a surplus highlights that citizens payed too much in taxes or obtained too little public services. Therefore, in a case of a surplus, it may be reasonably expected that politicians and citizens claim for tax cuts or public spending increases. However, surpluses are indispensable if states want to achieve their macro-economic objectives. Moreover, Posner and Gordon (2001) argue that surpluses should be used to repay debt. By lowering interest costs in the future, debt reduction enhances future budget flexibility since a larger amount of public spending may be devoted to public policies. In other words, paying off public debt allows to offset the loss of welfare suffered by citizens during economic downturns (Alesina 2000).

For all these reasons, we may assume that states, local governments or municipalities may also have incentives to use creative accounting in order to hide surpluses. Anthony (1985) shows that the objective of U.S municipalities is to report a small surplus. A mayor of a Swedish municipality cited by Knutsson et al. (2008) also mention that his *"strategy has always been to hide surplus money into depreciation and long-term financial investments, such as pensions. Otherwise some politicians can be tempted to use the surplus in day-to-day production. My intention is to prevent, or limit, the possibilities for expansion in different services and at the same time strengthen the long-term financial situation"*. Ballantine et al. (2007) also supply evidence that English non-profit hospitals try to reach a financial break-even, that is to avoid losses and surpluses. Pilcher (2011), who pays attention to local governments of the state of New South Wales (NSW) in Australia between 2003 and 2006 also indicates that they have incentives to smooth fiscal balances over time. According to the author, playing with depreciation charges appears to be particularly efficient to achieve such an objective. More precisely, Pilcher and Van Der Zahn (2010) suggest that local governments of NSW use unexpected depreciation to decrease financial performances. Then, Stalebrink (2007) also advances that Swedish municipalities could use capital depreciation to manage

reported financial performances.[12] In his view, Swedish municipalities would increase capital depreciation during good economic periods and would do the opposite to dampen deficits.

Moreover, those authors underline that such operations are possible in states or local governments having introduced accrual accounting instead of cash based accounting. Several authors debate the introduction of accrual accounting (e.g. see Carlin 2005; Ellwood and Newberry 2007; Falkman and Tagesson 2008) and agree that such accounting standard may provide some advantages to the public sector. Firstly, accrual accounting should increase the transparency inside the administration, which should increase the managers' accountability. Secondly, the raise of internal transparency should improve organizational performance and resource allocation. And thirdly, accrual accounting allows to better identify the full costs of public activities, which should lead to higher performances. A better knowledge of full costs allows for an increase in competition inside the administration but also outside with external competitors. Nevertheless, since accruals do not reflect cash-flows, authors also consider that accrual accounting may reduce accounts' transparency and that it would also help politicians to manipulate reported figures. As a consequence, it would seem that the same means used in the private sector provide the same issues in the public sector.

2.3   Theories of public deficits and other fiscal outcomes

Considering the public sector's share in GDP, the 20th century was marked by the growth of the State in the economy. Thus a fringe of the literature has been devoted to the description and explanation of this phenomenon (Tarschys 1975; Larkey et al. 1981; Holsey and Borcherding 1997). Since the 1970s, most OECD countries suffer from public deficits, which lead to a large increase of their indebtedness (Tanzi and Schuknecht 2000). Consequently, interest costs now account for a large part of the state budget, which may lead to some issues in terms of budgetary management (Martin 2008). Indeed, amounts allocated to the interest costs repayment are not allocated to public policies; it is thus a loss of elbow room in

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[12]At the same time, the author indicates that Swedish municipalities resort to large asset write-offs when deficits are expected to occur. Thus, his findings reveal that the public sector also has incentives to perform big bath accounting. We may therefore assume that the reasons are the same.

the use of public spending. Furthermore, because of higher indebtedness, states seem more risky in the eyes of financial markets. Thus, as suggested by Baldacci and Kumar (2010), states will probably have to shoulder higher borrowing costs, which will further aggravate the previous phenomenon. Because of their nature, these problems have caught the interest of many economists concerning the situation of public finance.

The willingness to solve the problems of public deficits and public debt first encouraged normative contributions. Those contributions principally debate two opposing economic perspectives: the classical perspective versus the Keynesian perspective. Whereas the former perspective supports that public management should promote a budget balancing policy (Lucas and Sargent 1981), the latter argues that budgetary policies should limit the impact of the cyclical economic fluctuations (Greenwald and Stiglitz 1988). Simultaneously to the normative theories, a large amount of literature investigate the determinants of public deficits and public debt. They are the positive theories. Those positive contributions are principally focused on economic, political, institutional and structural determinants of public deficits. The next two sections are devoted to detailing both theories.

2.3.1 Normative theories of public deficits[13]

Before debating the positive theories of public deficits, we present the three main normative theories treating the role of the budgetary policies. Indeed, both theories are tightly linked since positive theories may depend on the normative ones. The normative theories we present in this subsection are the so-called golden rule of public finance (classical theory), the regulatory state (Keynesian theory) and finally the rational expectations theory.

The golden rule of public finance

The concept of golden rule arises from the classical theory of economics. According to this school of thought, the market is the only device which efficiently provides goods and services and maximizes social welfare. That way, the role of the state should be highly limited. In other words, the state would only have to ensure economic environment stability (Majone

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[13]The theories we discuss in this subsection are extensively presented by Dafflon (1998), Novaresi (2001) and Martin (2008).

1994). In addition to the role attributed to the State, classical economists argue that the *user pays principle* should be respected.

In order to limit the size of the state, classical economists, notably James Buchanan, advocate that the government should levy the least possible taxes so as to avoid superfluous public spending. Then, in order to govern public finance in respect to the user pays principle, the classical economists formulated the golden rule. This rule imposes that operating expenses have to be integrally financed by operating revenues. That way, only the investment expenditure (sometimes called capital expenditure) may be, partially or totally, financed through public debt. For classical economists, as operating expenses benefit only the present generation, those operating expenses have to be integrally financed by means of the current financial resources. Conversely, as investment expenditure will benefit future generations, they will bear the costs of the infrastructure through the debt repayment.[14] In doing so, the beneficiaries circle matches the payers circles; the user pays principle is therefore respected. Then, in addition to comply with the inter-generational equity, the golden rule should reduce the fiscal illusion. Indeed, since citizens integrally pay for what they consume, they should be aware of the full costs of public goods and services. In such a case, taxes would thus represent the price of the public services. That way, citizens would ask for a quantity of public services corresponding to the social optimum and not above it.

The Regulatory State

The Keynesian school of thought argues that aggregate demand does not always match with the aggregate supply in a situation of full employment of the production factors (labor and capital). Public economies may reach equilibrium where production factors are underemployed. Such situations generate an augmentation of the rate of unemployment. Conversely, situations of overheated economies may occur when production factors are over-employed. In that case, inflation will reduce aggregate demand. The phases of under and over-employment of the production factors therefore highlight that the aggregate demand

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[14]At the origin, classical economists (Adam Smith or David Ricardo, for instance) advised a budgetary policy similar to the one of the private sector. This budgetary policy advocated that public spending, independently to their nature, do not have to exceed public revenues. In other words, the classical economists in the 19th century argued that public deficits have to be strictly banned. That way, by prohibiting deficits, governments would avoid suffering from the cost of the debt, which reduces the financial elbowroom in the use of public budgets.

tends to fluctuate around a potential output, which is the long-term growth trend. Economic fluctuations around this long-term growth trend thus refer to the business cycle. Finally, the output gap is represented by the difference between the effective production and the potential production.

In his theory, Keynes demonstrates that the market does not always allow full employment to be achieved. In light of the harmful consequences of the underemployment (increase of the unemployment rate) and the over-employment of the production factors (rise of the inflation), governments may have incentives to intervene in the market. Such an intervention through the government budget aims to reach an equilibrium between the aggregate supply and demand. The state may hence resolve a situation of over-employment by increasing taxes or by decreasing public spending. A situation of underemployment may then be resolved by resorting to the opposite measures. In other words, the Keynesian theory recommends states to embrace a counter-cyclical budgetary policy.

Furthermore, the automatic stabilizers influence the business cycle. The automatic stabilizers are defined as revenues (e.g. tax revenues) and expense (e.g. spending on social security) that respectively automatically change in concert and conversely to the business cycle. They thus contribute to maintain the equilibrium between the aggregate supply and demand. Moreover, the influence of the automatic stabilizers may also be seen on public finance. Indeed, in a situation of economic growth the state will enjoy higher fiscal balances, while the fiscal balances are expected to be lower during downturns. Consequently, to embrace a counter-cyclical budgetary policy, the state will have to save during economic growth periods in order to be able to offset the effects of economic downturns. To conclude, according to the Keynesian theory, the budget should not be seen as an end in itself but as a device allowing for a balanced economy (Orsoni 1978).

The Rational Expectations Theory

During the 70s a new school of thought, which debated the role played by the state budget, was born; it was the rational expectations theory. This new theory opposes the Keynesian one since it assumes that budgetary policies cannot be used for the purpose of economic recovery. Taxes and public spending should not be used to stimulate or curb the economic

activity during downturns or booms. According to this school of thought, it would be better, only in exceptional situations, to borrow today and to pay off debt over a long period of time through a small increase in the tax rate rather than by proceeding to an occasional and large raise of the fiscal burden. That way, the tax burden surplus should be minimized. Indeed, as supported by Alesina (2000), the tax rate should be as constant as possible over time in order to maximize social welfare. In this context, they recommend using indebtedness in order to smooth the tax burden over time and hence to tend toward a social optimum.

2.3.2   Positive theories of public deficits

A large amount of scientific literature deals with the explanation of public deficits. While some research aims at directly determining public deficits, another part pays attention to other related aspects. Among those aspects, the literature principally focuses on the public sector share in GDP, public revenue and spending and the determinants of indebtedness.

First of all, researchers started to focus their attention on the economic determinants of public deficits. Those researchers notably studied the influence of **economic growth** on public deficits. As commonly known, automatic stabilizers increase tax revenues and decrease public spending during an economic growth period. A higher surplus (or a lower deficit) should thus result from such a situation. Conversely, during a recession, economic stabilizers tend to decrease tax revenues and increase public spending, which would lead to larger deficits. Nevertheless, as suggested by Martin and Soguel (2004), governments would perform pro-cyclical budgetary policies that would tend to alleviate the effects of economic stabilizers. In other words, governments would be tempted to use additional revenue collected during booms in order to increase public spending. If this were to be true, the economic stabilizers effects are expected to be overturned, which would lead to smaller surpluses or larger deficits.

Some variables directly affected by the business cycle have an additional impact on public deficits. Among others, those variables include the **unemployment** rate. Since it affects public revenue as well as public spending, the unemployment rate is a major factor to be

taken into account when studying the determinants of fiscal balances. Indeed, because of the higher unemployment rate, social spending are higher in order to support the unemployed population. Then, as the tax base is diminished, tax revenues collected by the state will be lowered.

The question of **debt** also has to be handled when scrutinizing public deficits. Whereas these deficits are the origin of public debt, the latter also acts on the former. Indeed, governments will have to bear the cost of the debt, characterized by interest payments. Since interest payments are positively correlated with the debt level, the higher the debt level, the more interest payments will weigh down the fiscal balance. This situation may thus lead to some problems in terms of budgetary management (Martin 2008). Indeed, amounts allocated to the interest repayment are not allocated to public policies; it is thus a loss of elbow room in the use of public spending. Furthermore, because of deficits and the higher indebtedness level, the states appear more risky to the financial markets. That way, Laubach (2009) and Baldacci and Kumar (2010) demonstrate that states have to bear higher borrowing costs, which will further aggravate public deficits. This rollover effect of debt accumulation is known as the snowball effect of the public debt (Martner and Tromben 2012).

The **political ideology** of the parliament and the government also constitute a factor which may deeply influence public finance. Hibbs (1987) reveals that, as a rule, states with left-wing authorities are expected to implement more social public policies or public policies aiming at fighting against unemployment than right-wing authorities. As these public policies are often relatively costly, the author assumes that public spending will be higher in countries governed by left-wing authorities. Nonetheless, he underlines that public deficits will not necessarily be higher in those countries. Indeed, as left-wing authorities are expected to raise higher taxes than right-wing ones, the final effect on public deficits is undetermined. Later, Blais et al. (1993), who scrutinize 15 liberal democracies over a period of 28 years, demonstrate that parties on the left of the political spectrum do spend slightly more than parties on the right. That way, their findings highlight that *"parties do make a difference, but a small one"*. Then, focusing on 16 OECD countries between 1955 and 1989, Cusack (1997) reaches similar evidence. Tellier (2006) also demonstrates that, in Canadian provinces, the

governments' ideology has an influence on public expenditure. Indeed, her results show that left-wing parties significantly spend more than center and right-wing parties. Then, Hibbs's assumptions appear to be confirmed since Allers et al. (2001) demonstrate that Dutch municipalities with *"a council dominated by left-wing parties have a higher tax burden"*. Nevertheless, although these researchers highlight that left-wing governments tend to spend more than right-wing ones, other authors alleviate the importance of the governments' ideology for the public sector financial management. In this regard, Seitz (2000) who uses data on German Länder brings out that regional differences in public spending policy are only marginally determined by the ideological composition of the government. Similar findings are revealed by Galli and Rossi (2002) and Potrafke (2011) when they show that the composition of the government's budgets is not driven by the governmental ideology. Moreover, in spite of the expected spending behavior of the left-wing governments, none of the previous cited studies reveal whether left-wing parties accumulate larger deficits than right-wing ones. Besides, Imbeau (2004), who focuses his study on the explanation of fiscal balances, does not find any significant differences in terms of public deficits between jurisdictions governed by left-wing or right-wing authorities either. To the best of our knowledge, only Alt and Lassen (2006), who undertake extensive research on 19 OECD countries, find evidence that *"right-wing governments (for strategic reasons) tend to have higher deficits than left-wing governments"*.

The **political fragmentation of the government**, as the political ideology coherence of a government measured by the number of political parties in a cabinet, may be an issue in the explanation of public deficits. Roubini and Sachs (1989) assume that the disagreement between political parties in the decision making process would be another cause of public deficits. Indeed, it is increasingly difficult to reach an agreement when the number of stakeholders increases. That way, the greater the conflict between stakeholders, the more difficult it will be to enact deficit reducing measures. This assumption is consistent with the model of Valesco (2000), since he predicts that spending and deficits increase with the number of stakeholders associated in the decision-making process. Several studies have investigated the impact of government fragmentation on public deficits, and the results ensuing from them are quite contrasted. While Kontopoulos and Perotti (1999) and Ashworth and Heyndels

(2005), who respectively pay attention to OECD countries and Flemish municipalities, find evidence that the number of political parties in a coalition tends to significantly increase public spending, some other authors (Volkerink and De Haan 2001; Elgie and McMenamin 2008) do not reach the same conclusion.

Then, instead of concentrating on the number of political parties associated with the decision-making process, other researchers assess the importance of government size on public deficits. Always following the assumption of Valesco (2000), those studies aim at assessing whether or not larger cabinets generate higher deficits. That way, a larger number of spending ministers in a government would be associated with higher public spending and deficits.[15] This assumption is more widely defended in the literature than the previous one since several researchers focusing on OECD countries demonstrate that the number of spending ministers is positively correlated with the level of public deficits (Kontopoulos and Perotti 1999; Volkerink and De Haan 2001; Elgie and McMenamin 2008). Nonetheless, Ricciuti (2004) who also pays attention to OECD countries over the period 1975-1995, finds relatively poor evidence that government size influences fiscal outcomes. Therefore, as suggested by Elgie and McMenamin (2008), *"the importance of political fragmentation could vary according to the institutionalization of the political systems"*. Furthermore, Schaltegger and Feld (2009), who investigate Swiss cantons, also find evidence that a larger government generates significantly higher public spending. Ashworth and Heyndels (2005) also highlight that, in Flemish municipalities, during downturns, *"expenditure are cut back more in municipalities with fewer ministers"*.

The **solidarity between the executive and the legislative powers**, which may be measured as the proportion of government parties represented in the parliament, may be another aspect influencing public deficits. As suggested by Roubini and Sachs (1989), if there is no concordance between them, they will probably face difficulties in reaching agreements. The authors believe that this situation would result in excessive overall spending, and that deficits would therefore be higher. Studying a panel of 22 OECD countries, Volkerink and De Haan (2001) confirm this assumption by demonstrating that governments having a

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[15]This problem is known as the *common-pool resource problem.*

majority in parliament have lower deficits.

Moreover, by their own behavior around electoral periods, politicians may influence fiscal outcomes; it is the so-called **political business cycle**. According to Nordhaus (1975), politicians do not work for the population's general interest but are self-interested. The main objective of politicians would be to ensure their reelection. When an election approaches, politicians seek to obtain the citizens favor by increasing public spending and decreasing the tax burden. Such operations would deteriorate fiscal balances. Several studies tend to confirm this assumption. First, by focusing on a panel of 24 developing countries, Schuknecht (2000) affirms that governments tend to perform expansionary fiscal policies during election years. To achieve this objective, governments resort more largely to public spending increases in spite of tax decreases. Furthermore, as revealed by Kneebone and McKenzie (2001), opportunistic behavior is also perceptible in Canadian provinces. Indeed, their study shows that governments are inclined to increase visible public spending (e.g. schools, roads or hockey rinks) around electoral periods. The political business cycle also seems to be an issue at the municipal level, since Veiga and Veiga (2007) report that Portuguese municipalities tend to increase highly visible public spending during pre-electoral periods. Finally, Shi and Svensson (2002) found clear evidence of a political budget cycle in both developed and developing countries. Nonetheless, their findings highlight that the political budget cycle may depend on the government's probability to remain in power and also on the share of informed voters in the electorate.[16]

In addition to the political determinants, a portion of the literature devoted to public deficits and indebtedness focuses on **institutional factors**. The study of the fiscal rules or budget constraints is one of them. Indeed, at the national or subnational level of government or sometimes even at the municipal level, some countries have introduced budget constraints in order to ensure sustainable fiscal policies. Moreover, these budget constraints may have different forms since they are attached to government deficits, taxes, expenditure or debt. However, as previously discussed, the effect of such budget rules is unclear. Indeed, there

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[16]Instead of focusing on the parliament and government political composition as a whole, a new strand of literature also discusses the particular role played by finance ministers on the budgetary figures. Detailed evidence is presented in subsection 2.4.

is little evidence about their effectiveness on the government's fiscal soundness. For some authors, including Fatás and Mihov (2006), who scrutinize U.S. states, it is evident that fiscal rules lead to higher deficits. Contrastingly, Hallerberg et al. (2007a) have a more nuanced point of view since they argue that the effectiveness of budget rules will depend on the type of government and, hence, the political environment and constitutional characteristics, such as the electoral system. Conversely, Feld and Kirchgässner (2008) provide evidence that budget constraints allowed to reduce public deficits in Swiss cantons. Nonetheless, although Luechinger and Schaltegger (2011) reach the same conclusions, they argue that one must not rule out that deficits have been reduced, at least partially, through creative accounting operations. Some other authors, in European countries as well as in the U.S. states, put the emphasis on this perverse aspect surrounding fiscal rules.

Furthermore, Switzerland, which is a direct democracy, has two particular institutional tools aiming to restrain public spending and therefore public deficits: the fiscal referendum and the right of initiative. The fiscal referendum may be described as an institutional tool, which aims to put public spending under pressure. This expected effect may occur in two ways. Firstly, it can allow citizens to express themselves concerning spending that are put to the vote. Since citizens are perceived as more fiscally conservative than elected politicians (Peltzman 1992), it is expected that citizens will use fiscal referendums to avoid new public spending.[17] Secondly, fiscal referendums are launched only when a new spending exceeds a predetermined financial threshold. That way, the government will self-regulate and will pay attention to new spending if they do not want their project subjected to the popular vote. Nevertheless, the government may avoid this constraint by resorting to loopholes. Assuming a public project exceeds the financial threshold and subsequently is put to the ballot, the government may split this project into several sub-projects so as to avoid the financial constraint. More particularly, it must be underlined that there are two kinds of fiscal referendums: the mandatory and the optional. While the mandatory one is automatically launched if a public spending exceeds the financial threshold, the optional one is not. Indeed,

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[17]Studying the results of referendums is a good device to assess whether or not politicians respect the median voter theorem. If this were to be true, citizens would not reject a project subjected to the ballot since politicians would provide them with exactly what they want.

with an optional referendum, voters can call for a referendum on a new public spending by collecting signatures from a predetermined number of citizens. So far, empirical studies devoted to this instrument tend to demonstrate that referendums have beneficial impacts on budget figures (Martin 2008; Feld and Matsusaka 2003).

The right of initiative is the second institutional tool that citizens can use to influence cantonal public finance, since it allows citizens to propose new laws or modifications of the constitution. Nevertheless, it seems to be particularly difficult to predict the way in which this institutional tool will affect budget figures. On the one hand, as suggested by Feld and Matsusaka (2003), the right of initiative provides a way for citizens to cancel spending programs that fall short of the referendum spending threshold. In this respect, the right of initiative would have a positive effect on cantonal fiscal soundness. However, on the other hand, one must consider the probability that new laws and modifications of the constitution tend to worsen public deficits. The final effect of the popular initiative is therefore unforeseeable.

Some authors (e.g. Alesina and Perotti 1996) also devote their attention to the **budgeting process**, i.e. the different steps through which the budget is developed. More particularly, the recent literature opposes the bottom-up and the top-down budget process. Kim and Park (2006) demonstrate that OECD countries that use a top-down budget process, which is based on a government fixed funding envelope attributed to each ministry, are better at restraining public spending and deficits than countries that resort to bottom-up budget processes. Indeed, in a traditional bottom-up budget process, spending ministries dispose of an information asymmetry allowing them to formulate requirements that tend to be higher than their real budgetary needs, generating higher public spending and deficits. Nonetheless, Feld and Kirchgassner (1999) come to another conclusion as they find that, in Swiss municipalities, *"the bottom-up procedure incorporating direct democracy elements seems to be more promising for reducing public debt than a top-down procedure"*. Furthermore, Lauth (1978) indicates that implementing Zero-Base budgeting instead of the incremental budget process allowed for a reduction of financial inefficiencies in the U.S. states. The incremental budget process is often considered as inefficient since it simply consists in proportionally increasing public

revenues and public spending of the precedent year in order to establish the current figures (Wildavsky 1986). That way, the public spending would increase year after year without any economic justification.

Finally, another strand of literature is devoted to **more specific items**. For instance, Martin (2008) expresses some assumptions in regard to the population age. He assumes that an elderly population tends to increase deficits since tax revenues decrease and social spending increases. He has also formulated the same assumption for a young population. According to his point a view, in the presence of a young population, the educational spending are higher and the tax revenues are smaller than in the presence of an active population. Also considering demography, Feld and Kirchgässner (2008) for instance, suggest that urban localities would suffer higher deficits since their inhabitants claim for larger public services such as public cultural goods.

2.4   Finance ministers in the public sector financial management

It is notably by starting to pay a meticulous attention to the literature devoted to government fragmentation that strong evidence is given regarding the **importance of the finance minister** in a cabinet. As defined by Kontopoulos and Perotti (1999), *"fragmentation arises when several agents or groups participate in the fiscal decision-making process, each with its own interests and constituency to satisfy, and each with some weight in the final decision. To participate in the majority, each group demands a share in the budget; as all groups do this, the end results is a high level of expenditure or a large deficit"*. The latter phenomenon ensuing from the government fragmentation is commonly known as the common pool problem and has largely been discussed in the literature.[18] Then, as argued by the authors, *"fragmentation of the fiscal policy decision-making process is closely related to the notion of internalization of the costs of fiscal policy"*.

That way, in order to curb the spending ministers' appetite for higher public spending,

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[18]For more detailed information about the common pool problem, see among others Von Hagen and Harden (1995), Alesina and Perotti (1999) and Valesco (2000). Moreover, Borge (2005) provides first evidence about the finance minister's capacity to mitigate or even cancel the common pool problem.

it is widely recognized that finance ministers may play a key role in that matter. Indeed, if the finance minister determines at first the total size of the financial means at the spending ministers' disposal, theoretically he is in a better position to better internalize the costs of aggregate public spending. In such a situation, spending ministers would only have the opportunity to bargain over the budget distribution (Kontopoulos and Perotti 1999). In other words, if the country's financial responsibility is borne by the finance minister, it means that a situation in which every spending minister develops his own spending plan is avoided. Nevertheless, it is only in particular circumstances, i.e. in particular budget process and/or institutional framework, that finance ministers have the power to alleviate the so-called common pool problem.

Among these particular circumstances, Hagen (1992) argues that budgetary procedures lead to greater fiscal discipline if they give a strong prerogative to the prime minister or the finance minister, if they limit universalism, reciprocity, and parliamentary amendments, and if they facilitate strict execution of the budget law. Regarding the key role carried out by finance ministers, Woo (2003) also stipulates that *"a budgeting process that allows the prime minister or finance minister to have a dominant position over the spending ministers, and limits the amendment power of parliament is conducive to fiscal discipline"*. Some authors have investigated the **finance minister's power** in a government and his capacity to influence the spending ministers' behavior. At first, Hallerberg and Wolff (2008) argue that *"a strong finance minister is able to centralize the budget process when there are few or no important ideological differences within the coalition"*. Moreover, Feld and Schaltegger (2010) also highlights the importance of a strong finance minister in order to resolve the common pool problem. From their point of view, a finance minister may be considered as strong depending on his capacity to remain in office on the long run. In other words, the longer the finance minister remains in office, the stronger he is. Indeed, *"a finance minister who succeeds in remaining a long time in office usually enjoys a political powerful position towards the parliament, the administration and the interest groups"*. Consistently with the former assertion, more experienced finance ministers evidently enjoy a strategic advantage with respect to spending ministers who have shorter tenure.

While it is debated that, under particular conditions, finance ministers should be willing to resolve the common pool problem, it is still needed to point out their **personal interests** or motivations in performing this task. Stein (1998) provides food for thought when he argues that *"finance ministers, who typically respond to the general interests rather than to geographical or sectoral interests, should reduce the extent to which fiscal decisions are subject to the common problem"*. That way, in the light of the last argument, finance ministers would have different incentives in comparison with other stakeholders associated in the budget process. Relying on a literature specifically devoted to the understanding of finance ministers' role in the public sector financial management (Hallerberg and Von Hagen (1997); Moessinger (2012); Jochimsen and Thomasius (2014)), their common features may be summed up as follows:

First of all, the finance minister is the central player within the budget process since he is responsible for the annual budget preparation and execution. Secondly, in contrast to spending ministers, the finance minister is less in charge for particular projects or particular groups in society. We may therefore presume that it mitigates his personal incentive to fight for higher funds. As he takes over the responsibility for the whole budget and its development, his incentives to ensure sustainable fiscal soundness should be the highest among the cabinet members. In other words, he is expected to tame his collegues' spending appetite as much as possible in order to avoid or at least alleviate public deficits. Indeed, the budget deficits level is usually the main indicator used in order to assess the finance minister's effectiveness. Thus, it may reasonably be argued that *"his prestige and hence his personal benefits depend on the effectiveness of his ministry"* (Hallerberg and Von Hagen 1997). As a consequence, his political success is tightly linked with a sound fiscal policy and only this policy will raise his prestige, and, thereby, his reelection chances.

However, despite the general considerations surrounding the particular role taken on by the finance ministers in cabinets, only minimal evidence has been provided so far as to their **influence on fiscal outcomes**. First, researchers aiming at filling this gap focused on power detained by finance ministers. In that way, using data on 57 developed countries from 1970 to 1990, Woo (2003) assumes that a budget process that allows the prime minister or the

finance minister to have a dominant position over the spending ministers, and limits the amendment power of parliament is conducive to fiscal discipline. In his research, the author uses an index of centralization (around the finance minister) for the budget preparation steps and shows that the more centralized the budgetary authority is in the finance ministry, the smaller the deficits are. Afterwards, it has been shown by Krogstrup and Wyplosz (2006) that a strong finance minister can best address the common pool problem. This is notably in line with the works accomplished by Feld and Schaltegger (2010) who test whether political stability impacts fiscal policy by running a time series analysis relying on the Swiss federal government between 1849 and 2007. Measuring the political stability as the number of years that a federal finance minister remains in office, they provide strong evidence that the more experienced a finance minister is, the better the fiscal soundness. Moreover, as suggested by Alesina and Ardagna (2010), their results reveal that higher public surpluses are reached thanks to lower public spending.

Then, other contributions have attempted to provide strong empirical evidence that finance ministers may be able to resolve **problems ensuing from the government's fragmentation**. Hallerberg and Wolff (2008) tend to reach this objective when they question whether a strong finance minister leads to lower sovereign risk premia. Using an index established by Hallerberg et al. (2007b) to depict the particularities of a strong finance minister, the regression results demonstrate that stronger finance ministers are assimilated with lower spreads. At the same time, Jochimsen and Nuscheler (2011) shows that coalition governments issue significantly more debt than single party governments. As their data suggest, this result crucially hinges on the position or strength of the finance minister within coalition governments. They find that coalition governments with a finance minister who shares the same political ideology as the prime minister are – in terms of borrowing – not significantly different from single party governments.

Furthermore, it would appear that **finance ministers' educational background and professional experience** would matter for the direction of fiscal policies. For instance, using data relative to professional training of more than 1500 policy makers, which includes the finance ministers, in 29 emerging countries between 1977 and 1999, Chwieroth (2007)

investigates whether policy makers educations matters for the liberalization of controls over international capital movements. Relying on the assumption that individuals trained in neoliberal universities are socialized and should be more disposed to adopt neoliberal ideas, author shows that neoliberal finance ministers matter for policy choices, i.e. have effectively a pronounced effect on neoliberal policies adoption. Then, first evidence has been provided by Jochimsen and Thomasius (2014) that the finance ministers' professional experience prior to their nomination affect public debt. Moessinger (2012) also undertakes research providing further information on the issue since he simultaneously tackles the influence of both educational and professional background on fiscal outcomes. Focusing on European countries between 1980 and 2007, the author highlights that the finance minister's experience and education affect the accumulation of public debt. The political experience is notably decisive since the more experience a finance minister has gained in former positions, the lower the public deficit is. Interestingly, results have revealed that finance ministers with an educational background in law tend to reduce the level of debt.

Finally, a couple of scientific contributions have been devoted to the influence of finance ministers' personal characteristics on particular fiscal outcomes. For instance, in a first research using a panel data relative to the 26 Swiss cantons over the period 1980 - 2007 and to the 99 finance ministers in position during the considered period, Chatagny and Soguel (2012a) question whether the **finance ministers' political ideology** affects the accuracy of tax revenue forecasts. At the same time, they go one step further by investigating whether the effects of finance ministers' political ideology depends on how they are ideologically aligned with spending ministers. Again, authors suggest the governments' fragmentation is at the heart of political strategies. It is indeed assumed by authors that finance ministers would not be tempted to underestimate tax revenue projections if they share their colleagues' political ideology. Furthermore, it is expected that right-wing finance ministers perform more conservative estimations, i.e. they would tend to underestimate tax revenues to a larger extent than left-wing ones. Their results reach the conclusions that *"tax revenue projections are manipulated for ideological reasons"* since it is demonstrated that right-wing finance ministers effectively more largely underestimate tax revenue forecasts. Moreover, the

greater the ideological gap between ministers, the greater the tax revenue budgeting error. More recently, Chatagny (2013) carried out a new analysis designed to tackle whether fiscal rules could alter the findings mentioned above. While his results highlight the existence of a significant relationship between the finance ministers' political ideology and the tax revenue underestimation, it is argued that stringent fiscal rules seem to compel finance ministers to resort to accurate projections.

To the best of our knowledge, the literature mentioned above is the only one especially devoted to the role played by finance ministers in governments. Moreover, there does not appear to be other empirical contributions measuring the impact of finance ministers, and especially their personal characteristics, on diverse fiscal outcomes.

Nevertheless, without having focused their attention on finance ministers, some academic contributions have considered the role played by particular politicians in the public policies management. In this respect, some authors have first questioned whether the **political leaders' gender** could influence political and economic outcomes, since men and women would have different policy preferences. Using a database on 265 Village Councils in West Bengal and Rajasthan (India), Chattopadhyay and Duflo (2004) wonder whether the provision of public goods differs depending on the political leaders' gender. Further to their investigation, authors demonstrate that leaders invest more largely in public goods that directly match to the expectations and needs of their own gender. Similarly, Ferreira and Gyourko (2014) scrutinize the budget composition of U.S. municipalities with regards to the mayor's gender. Conversely to the previous research, results show that female mayors do not conduct different policies than male mayors.

As often assumed, politicians' behavior would not be innate but rather acquired throughout their life and experiences. Consequently, special attention has been paid to the **head of government's (president or prime minister) educational and professional background**. Zhang and Congleton (2010) offer a first insight into this when they show that *"both career paths and education have significant effects on a president's economic policy judgment"*. Other authors have also tackled the relationship between personal characteristics and different political and economic outcomes. For instance, Somogyi (2010) performed an

in-depth analysis covering 64 countries over the period 1970 - 2002 in which he investigates the impact of political leaders' profession, education and political leaning on public finance. In the light of his results, it emerges that former managers or professional politicians with a degree in law statistically run larger deficits than other politicians. Nevertheless, the author cannot assert the existence of a partisan behavior on public finance. In other words, in this particular case, fiscal soundness would not be affected by the politician's political ideology. These results are strongly in line with those of Mikosch and Somogyi (2009) who show that political leaders in 22 OECD countries having professional experience in the economic field generate higher deficits than the average. Furthermore, although it is assumed that political leaders' behavior is mainly determined by their educational and professional experiences, Hayo and Neumeier (2011) reveal that the **socioeconomic status** of the prime minister of German local governments also helps to explain the fiscal performance. Prime ministers having poorer socioeconomic backgrounds generally engender higher levels of public spending and debt financing. Finally, the influence of political leaders' education and professional background has been extended to other fields of research. It is in this way that Dreher et al. (2009) and Somogyi (2010) explore whether the head of government's personal characteristics matter for reforms implementation. Interestingly enough, the same conclusions may be drawn from both studies, namely, that reforms are more likely during the tenure of former entrepreneurs belonging to a left-wing party. Nevertheless, no significant relationship may be depicted concerning the influence of the politicians' education.

With regard to our field of interest, some connections may also be drawn with the literature devoted to the importance of **central bankers' personal characteristics** in the direction of the monetary policy. They are Chappell Jr et al. (1995) who first provided evidence that the central bankers' professional experience may matter for monetary outcomes. Studying the Federal Open Marker Committee members, authors demonstrate that experience at the Federal Reserve Board is correlated with stronger preferences for monetary ease. Using a panel data relative to 20 countries over 50 years, Adolph (2003) also reveals that central bankers' career counts for monetary policy. That way, central bankers with a background in the financial sector tend to have more conservative behavior with respect to inflation com-

pared to central bankers of whom have a more bureaucratic experience. Similarly, it has been highlighted that Monetary Policy Committee members of the Bank of England tend to vote for interest rate increase when inflation is expected to increase. Nevertheless, members' differences in voting would be mainly explained by previous career background (Riboni and Ruge-Murcia 2008). Whereas most of the existing research deals with the importance of central bankers' professional experience, Göhlmann and Vaubel (2007) go one step further by providing new evidence about the influence of central bankers' education on monetary policy. The main conclusion ensuing from their research stresses that former students in law significantly prefer higher inflation rates than former students in economics do. Nevertheless, these results have to be interpreted in the light of the central bankers' career path. Finally, Farvaque et al. (2009) integrate the central bankers' gender in their model when exploring the determinants of inflation and reach the conclusion that women would be more risk averse than men.

Without paying attention to politicians, several laboratory experiments have been conducted in order to assess the influence of **citizens' educational background** on their behavior. It was notably done by Garrett and Lange (1991) who implemented a research relying on the belief that the study of economic sciences influences students' view. The authors' research consists in performing an analysis during which students had to decide whether to maximize a company's profits by laying off half of its workforce or to make lower profits by firing less employees. In the light of their results, it was concluded that students in economics have a much stronger tendency to maximize profits than other students. These results are besides consistent with those reached 25 years later by Rubinstein (2006). Thereafter, a couple of other experimental studies have aimed at determining whether people's educational background could mold their behavior and personal characteristics. A first overview is given by Frank et al. (2000) who question the relationship existing between a person's education and his behavior in economic decision making. As brought out by Frey and Meier (2003), students in the field of economics are generally more selfish and less cooperative than students of other faculties. Similar evidence has also been provided more recently by Frey and Meier (2003). However, authors do not reach any agreement whether the level of selfishness of

students is due to self-selection or to indoctrination. As a consequence, conversely to Carter and Irons (1991), it cannot be asserted that *"economists are born, not made!"*. Nevertheless, the selfishness of students in economics could partly explain why Marwell and Ames (1981) reach the conclusion that economics graduate students tend to free ride to a larger extent than other students in regards to their investment in public goods.

Simultaneously to studies devoted to citizens' educational background, academicians have carried out experiments aiming at evaluating the relationship between people's personal characteristics and diverse political and economic outcomes. **Citizens' gender** has notably been the object of a particular scrutiny. For instance, examining survey data collected in Detroit and Toronto in 1988, Warner (1991) exhibits that, for women in both cities and for men from Toronto, having female children increases the support for feminism. Using data relying on U.S. households, Jianakoplos and Bernasek (1998) examine whether there are gender differences in financial risk taking. Although results maintain that women are more risk averse than men, authors warn that risk aversion also depends on person's age, race and number of children. Among all personal characteristics, it would also appear that religion could, at least partially, lead people's behavior. Thus, in the light of a research performed by Sapienza et al. (2006), it ensues that different religious affiliations and ethnicity are associated with different preferences for income redistribution.

To conclude, and logically enough, comparable investigations have been carried out in the **private sector**. That way, despite considering political leaders, there are firms' top managers who have also been the center of attention of scientific contributions. Again, **managers' educational background and professional experiences** have been largely dissected by scholars since these characteristics may have a strong influence on diverse corporate outcomes. It is in that way that Bertrand and Schoar (2003) read that *"managers are often perceived as having their own style when making investment, financing and other strategic decisions, thereby imprinting their personal marks on the company they manage"*. Without any doubt, we may assume the same is true regarding the finance minister's importance in the public affairs direction. It is therefore all the more relevant to consider the literature devoted to the private sector managers' personal characteristics. Among this literature, Bertrand and

Schoar (2003) provide first evidence as to the importance of **managers' age and training**. They notably reveal that older CEOs seem to be more conservative in their decision-making and that CEOs having a MBA appear to follow more aggressive strategies. Analyzing dataset based on 592 supervisory board members of 29 German public and private banks during the European financial crisis, Hau and Thum (2009) argue that banks supervised by members having low financial experiences had lower financial performance during the 2007/2008 financial crisis. In addition to this the **firms managers' gender** has also been subjected to a specific analysis. For instance, Carter et al. (2003), who examine *Fortune* 1000 firms, highlight a significant positive relationship between the board diversity and the value of the firm. In other words, the larger the representation of women in the board of directors is, the higher the firm's value is. On the evidence of some other studies, the impact of managers' gender could also be felt on corporate strategies. Thus, risk aversion would notably be explained by gender differences (Powell and Ansic 1997) and investment behaviors by mutual funds would differ depending on the manager's gender (Atkinson et al. 2003). Finally, more sophisticated research has aimed at cross referencing several personal characteristics in order to provide richer conclusions. For instance, Johnson and Powell (1994) highlight that managers' gender can impact decision-making but only under certain circumstances. They also argue that educational background would erase gender differences with regard to decision quality and risk aversion. Moreover, it has been more recently defended by Jensen and Zajac (2004) that managers' strategic choices vary regarding the position they occupy (CEO or executive and non-executive director), even if they share the same functional background experience.

2.5 Knowledge gap

As it has just been highlighted, a large part of the literature devoted to creative accounting aims at providing definitions of the notion and/or at measuring the phenomenon through more or less sophisticated methods. In both private and public sectors, it is mainly agreed that creative accounting is used to hide bad news, i.e. to show better financial performances than they are in the reality. This is even more true in the public sector since most of the

literature provides strong evidence that the resort to creative accounting is greater when governments have to cope with stringent fiscal rules prohibiting deficits. However, only a few attention has been paid to governments using accounting tricks in order to conceal surpluses; though it is reasonable to assume that such gimmicks could be embraced by governments. Our research therefore aims first at filling this gap.

Furthermore, it is almost exclusively asserted in the literature that accounting tricks have *"no structural incidence on government finance"* (Milesi-Ferretti and Moriyama 2006). Although we partly share this point of view, we also withdraw from it in our research. Indeed, we sustain that when creative accounting is used for preventive purposes, i.e. in order to accumulate cookie-jar reserves by saving surpluses through unorthodox measures, such gimmicks may engender positive structural incidences on fiscal soundness. Concrete proof is thus still absent in the literature that creative accounting may have positive and structural influence on the governments' financial performance.

Then, no resounding evidence is provided regarding the determinants of creative accounting. While it is relevant to consider that the use of such practices mainly occurs because of economic (i.e. the occurrence of a deficit or a surplus) or institutional constraints (i.e. more or less stringent fiscal rules), we may also reasonably assume that politicians' personality may have a fundamental role in this issue. Indeed, a pretty non-existent but growing literature more and more brings out that policy makers matter in the direction of public policies. Consequently, by investigating whether the resort to creative accounting differs depending on the finance ministers' personal characteristics, we partly fill the last two knowledge gaps.

Finally, although finance ministers are key actors in the budget process and are assumed to influence public deficits and indebtedness, only few evidence has been provided so far. Consequently, by explaining creative accounting (which is expected to structurally impact public deficits) through the finance ministers' personal characteristics, possibilities are also given to indirectly highlight finance ministers' personal characteristics that allow to structurally improve governments' financial performance. Indeed, it is through the policies they implement that finance ministers may structurally change the curb of public deficits over time. The current research should therefore provide glimpses as to the influence played by

finance ministers on the governments' financial performance.

3   General context of creative accounting in Swiss cantons

In this section, a general presentation of creative accounting in the specific case of Swiss cantons is proposed. First of all, we introduce actors interested in financial information and their particular need of it. An insight is then provided as to the financial legislation shaping the way public finance is or should be managed in Swiss cantons. Finally, particular attention is paid to the role played by finance ministers and internal auditors.

3.1   Actors interested in accounting and financial information

Figure 1 below presents actors associated to the budgeting process or at least interested in financial information ensuing from it. Considering the finance minister is at the center of the political game investigated in this research, he is the first actor presented in Figure 1. Around him a multitude of stakeholders gravitate. In Figure 1, we report, on the horizontal axis, the extent to which actors are away from finance ministers. In this research, it is assumed that this distance if negatively correlated with knowledge in accounting, as depicted on the vertical axis. Only auditors occupy a particular position. They are situated above other actors since they are expected to have the greatest knowledge in accounting. Furthermore, they are ranged from finance ministers to deputies as they scrutinize the State apparatus as a whole.

Figure 1: Actors interested in financial information
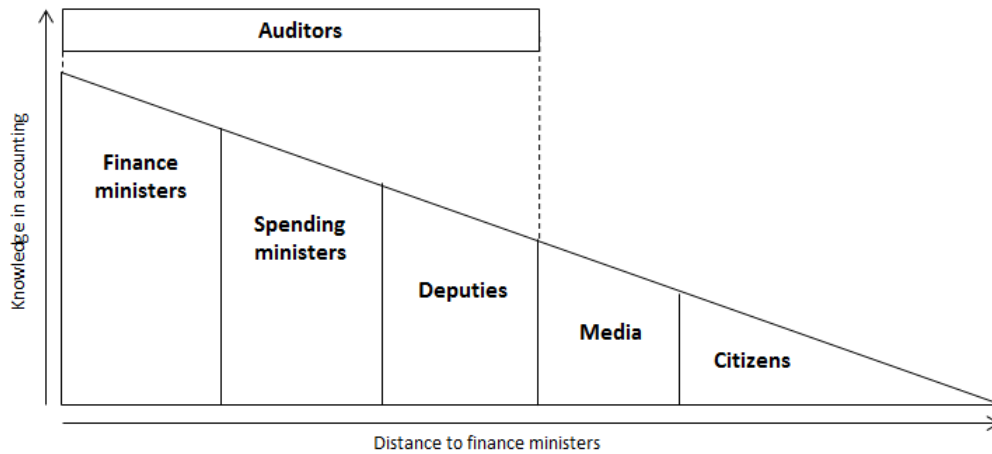
Source: Own presentation

As mentioned in the introduction, the **finance minister** is considered as the key actor as he supervises the creation and the provision of financial information. As he heads the ministry of finance, he is in charge of managing cantons' public finance throughout the year and his role is to communicate the governments' financial situation after the reporting process. Communicating the cantonal financial situation is essential because it informs stakeholders how public money has been used throughout the year. For **spending ministers** and **deputies**, knowing their cantons' financial results is crucial as their public policies depend on the resources that are at their disposal. It is thus partly in light of these financial results that spending ministers and deputies will formulate their budgetary requests for the subsequent year. For **citizens**, such financial information is also fundamental as it reveals whether they received the appropriate level of public services compared to the taxes they paid. Or, on the contrary, whether the difference is to their advantage (in case of a deficit) or to their disadvantage (in case of a surplus). However, to get the desired information, citizens strongly rely on the **media**. Although figures reported by the finance ministers are publicly available, their technical nature discourages not to say prevents most citizens looking at public accounts. Therefore, it is through the news provided by journalists, who have attended press conferences or have written articles based on press releases, that citizens mostly get information relative to the cantonal financial situation. Finally, assuming a role of general

interest, **auditors** scrutinize financial figures reported by the finance ministers. Concretely, their main task consists in avoiding financial data suffering any irregularities regarding cantonal financial laws. In other words, they have to ensure that stakeholders can deal with reliable financial information.

3.2 Representation and communication of financial information

As mentioned, financial information reported by finance ministers is crucial as it is used by spending ministers and deputies to formulate their budgetary requests for the subsequent year. For exemple, in a case of a surplus, claims for higher public services or lower taxes may arise from these stakeholders (Tellier 2006). To some extent, media and citizens may also be expected to formulate similar requests. Nevertheless, in order to make up their own minds and thus formulate their requests, stakeholders need to rely on a true and fair representation of the governments' financial situation. In other words, they need reliable financial information telling the reality precisely as it is.

But, on the other side of the spectrum, finance ministers do not necessarily share the same interests. Finance ministers' main objective being to ensure fiscal soundness, they are expected to fight against requests for higher public spending or lower tax revenues. As a consequence, to avoid those claims, finance ministers could be willing to report the reality that suits their own interests. For example, finance ministers may have strong incentives to hide the surplus reported in the statement of financial performance.

In light of what has just been explained, it may be reasonably argued that finance ministers can communicate financial information in two different manners. Indeed, as depicted in Figure 2 below, finance ministers might have the willingness to provide either a true and fair financial information representing reality or a political information suiting their own interest.

Figure 2: Ways of communicating financial information for finance ministers
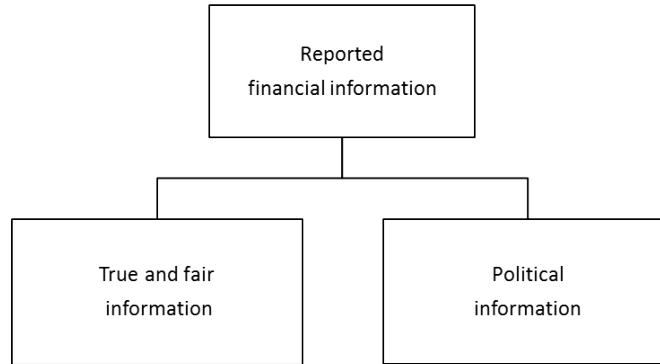
Source: Own presentation

The tradeoff between these two manners of reporting and thus communicating financial information also prevailed when the harmonized accrual accounting model for Swiss cantons (HAM1) was designed in the late 1970s.[19] Indeed, tension arose between two points of view as reported in Figure 3 below. The technical wish was that the accounting model should embrace an *economic vision* of accounting and press for true and fair financial reporting. That way, when truly and fairly communicated, the reported governments' financial situation represents the reality precisely as it was. This way of reporting public figures, which is the essence of accounting, is notably promoted by IPSAS norms. But the HAM1 and thus cantonal legislation also embrace a more *political vision* of accounting, offering the possibility to use accounting in a more conservative manner. Concretely, this political and conservative vision of accounting allows to influence the reported governments' financial situation by resorting to additional depreciation charges and special funds. In such circumstances, although this way of presenting public accounts is legal, the reported governments' financial situation is no longer true and fair. However, when manipulations performed on public accounts infringe cantonal legal framework, the communication of the governments' financial situation is untrue and unfair in addition to being fraudulent.

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[19]This tradeoff is still perceptible in cantonal financial laws, which also allow the use of additional depreciation charges and special funds. Indeed, the accounting model only having the status of recommendations, it had to be transposed in each cantonal legislation to have legal force. As a result, Swiss cantons took the opportunity to tailor the HAM1 to their own needs when transposing the recommendations to their own legislation governing public finance.

Figure 3: Presentation of reported figures according to the HAM1 and cantonal financial laws
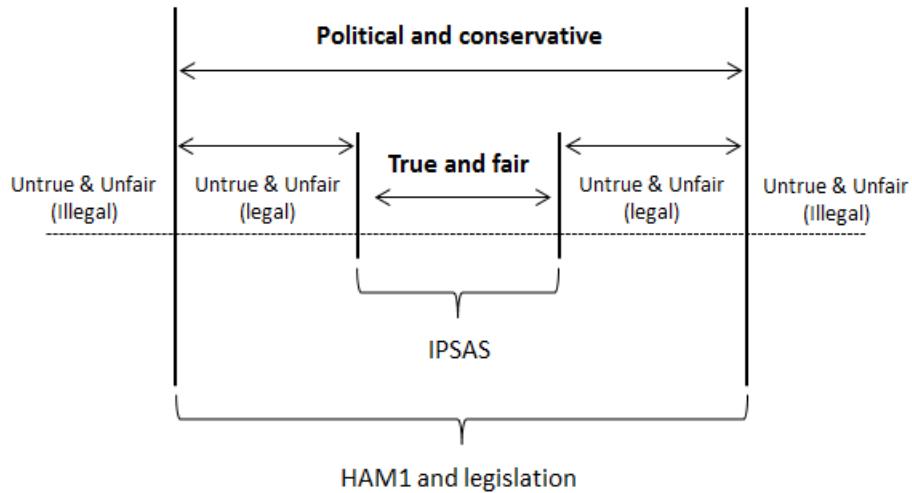
That way, whether we only concentrate on the essence of accounting and indirectly on the vision of accounting defended by IPSAS norms, every operation tending to violate the true and fair representation of the governments' financial situation should be considered as creative accounting (see Figure 4 below). However, in the light of the HAM1 and of most cantonal financial laws that also allow a more political and conservative vision of accounting, additional depreciation charges and special funds are simply considered as political tools. In other words, according to the HAM1 and cantonal financial laws, these operations are not creative accounting.

Figure 4: Nature of additional depreciation charges and special funds
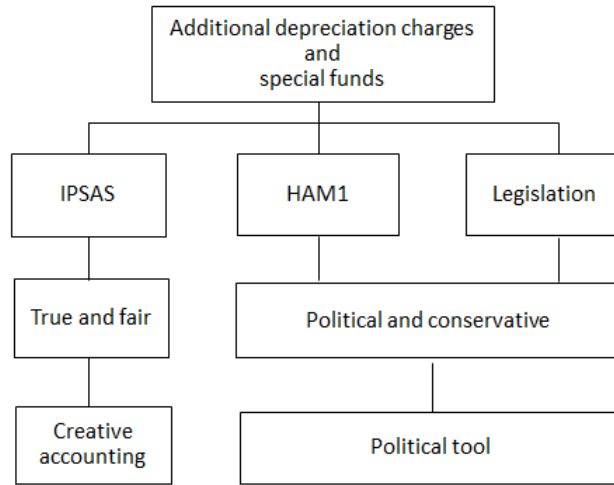
3.3 Information asymmetry, an advantage at the finance ministers' disposal

Compared to spending ministers, deputies, media and citizens, finance ministers have a specific expertise in accounting that makes it quite easy for them to enjoy information asymmetry. The finance minister heads the ministry of finance and is *"typically responsible for managing the annual budget process. This gives him a considerable informational and strategic advantage over the other cabinet members, which he can use to pursue his [own] political agenda"* (Von Hagen 2010). This argument is also sustained by Bergmann (2009) who reads that finance ministers *"obviously have the largest amount of information"*. Moreover, as noted by Zimmerman (1977) or Giroux (1989), their knowledge and expertise on accounting provides them with strong advantages regarding the information provided in financial reports. In other words, finance ministers profit from information asymmetry in the budget process that allows them to draw on accounting tricks to disguise the reported balance of the statement of financial performance in accordance to their own target. Not understanding financial information reported in public accounts because of a lack in accounting knowledge, politicians, citizens and media only concentrate on the bottom-line, i.e. the reported balance.

3.4 Auditors as a barrier against information asymmetry

A priori, spending ministers, deputies, citizens and media should not have to question the

reported balances since they have been validated by internal auditors. Indeed, internal audits have been implemented in order to resolve or at least alleviate the information asymmetry between finance ministers and other stakeholders (Bergmann 2009). However, even if international accounting standards stipulate that reported figures have to express a true and fair representation of reality, auditors have to assess public accounts in the light of cantonal financial laws. As there are legal possibilities for finance ministers to play with additional depreciation charges and special funds to shape the reported balances, it is impossible for internal auditors to denounce such practices, while they misrepresent the real picture of the governments' financial situation.

This explains why stakeholders only devote their attention to the bottom-line. Lacking competences in accounting, stakeholders implicitly rely on the auditors' expertise to formulate their requests. However, since auditors have to scrutinize public accounts in the light of cantonal financial laws, they do not criticize additional depreciation charges and special funds and approve reported figures. Stakeholders are thus not encouraged to look above the line as public accounts have been approved.[20] As a consequence, it could not be easier for finance ministers to depict the image of the governments' financial performance that best suits their own interests.

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[20]Moreover, due to their lack of accounting knowledge, stakeholders do not understand the concept of depreciation. That way, they do not feel the difference between ordinary and additional depreciation charges. As a consequence, they are not in a position to understand that additional depreciation charges violate the true and fair view of governments' financial situation. Therefore they do not notice that the picture communicated by the finance ministers does not strictly depict the reality.

4 Hypothesis

In this section, the attention is devoted to hypothesis that will be tested in the different empirical analysis. But first of all, we introduce some preliminary considerations by reporting a timeline covering the budgeting process to the financial reporting. This should help to provide a better comprehension of the framework in which the practice of creative accounting is implemented. Especially in this first subsection, we discuss the reasons that may incite Swiss cantonal governments and especially cantonal finance ministers to resort to creative accounting. Secondly, based on this discussion, we formulate the hypothesis regarding the expected impacts of such practices on the governments' financial performance. Thirdly, in the last subsection, we investigate the determinants of creative accounting. More specifically, we tackle whether finance ministers' personal characteristics matter for the use of accounting gimmicks. Again, an hypothesis is formulated for each personal trait as to their respective influence on the resort to such accounting practices.

4.1 Preliminary considerations

A usual fiscal year in Swiss cantons may be subdivided in three distinct stages, which are partially superimposed on each other over time. These three different stages constituting a fiscal year may be graphically summed up as follows:

Stage 1: The budgeting process

The budgeting process is a succession of technical, administrative and political steps through which the subsequent annual budget law is conceived (Rubin 2000). It is generally developed between September and December of the year *t-1*, as represented in Figure 5 below. The budgeting process starts with a technical procedure aiming at forecasting the amount of tax revenues that will be available for the subsequent fiscal year (year t). Simultaneously, spending ministers provide their requests, that are the anticipated spending for the coming fiscal year, to the ministry of finance. Then, after having collected the tax revenue forecast as well as the requests of credits, the ministry of finance (strongly under the leadership of the

finance minister) designs a budget proposal (i.e. the available amounts of public services that could be provided by each ministry). This budget proposal is generally put under pressure and is subject to harsh negotiations between the ministry of finance and the other ministries. Indeed, whereas each spending minister tries to monopolize financial resources as much as possible, the finance minister arbitrates these requests in order to balance the anticipated spending with the tax revenue forecast. Finally, after this bargaining phase, the budget proposal is submitted to the cantonal parliament in order to enact budget law of the year t.[21]

Figure 5: Graphical representation of a fiscal year in Swiss cantons
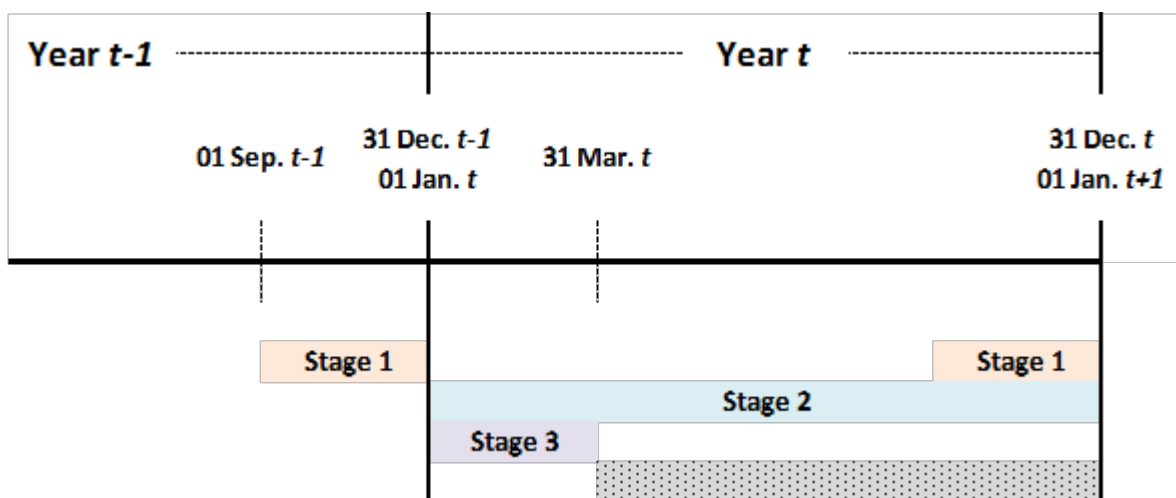
Source: own graphical representation

Stage 2: The budget execution

During the fiscal year t, the annual budget law serves as a guide for the public policies implementation. Nevertheless, for a multitude of reasons, the direction of the budget law might sometimes deviate from the forecasts. Most of the time, it may be due to spending ministers or deputies who, during the course of the year, are tempted to apply for supplementary credits to the parliament. Notably such applications for supplementary credits mostly

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[21]The budgeting process presented here refers to the traditional bottom-up approach. However, since early 90s this initial approach has sometimes been replaced by the top-down approach in some jurisdictions. Through this new approach the ministry of finance is at the first stage of the budgeting process since it sets the overall public spending ceiling for each line ministry (Kim and Park 2006). The top-down budgeting process is innovative as it allows line ministries to enjoy more flexibility in the use of financial means (Summermatter 2013). Indeed, detailed resource allocation decisions to individual appropriations are made by line ministries within the spending ceiling (Kim and Park 2006).

arise between March and December of the year t, namely after the reporting of the statement of financial performance of the year *t-1*. And such claims are all the more likely when the reported balance of the statement of financial performance of the year *t-1* boasts an excess of tax revenues over operating expenses. The period during which this wheeler-dealing may appear is represented by the gray area in the figure above.

Stage 3: The financial reporting

The third and final stage, occuring between January and March of the year t, consists in the financial reporting through which notably the balance of the statement of financial performance of the year *t-1* is determined. The financial reporting is a crucial stage since it provides useful information about how the public money has been used and therefore also provides information regarding the budgetary decision-making process of the subsequent year, i.e. investment capacity, need for borrowing, etc. One must therefore bear in mind that the financial reporting is a highly strategic stage. That way, in order to ensure the quality of the decision making process, policy makers strongly need true and fair financial information.

Due to its strategic stakes, the financial reporting is without any doubt subjected to political attention. Consequently, in order to influence the political debate (for their own interests), it may be reasonably asserted that cantonal finance ministers would have strong incentives to manipulate the reported balance of the statement of financial performance *"towards the desirable results"* (Naser and Pendlebury 1992). For instance, while a government compelled by a stringent fiscal rule would certainly look to dissimulate a deficit through the resort to closing operations, the inverse may reasonably occur whether a surplus is expected. In such a situation, we presume that finance ministers manipulate downward the reported balance of the statement of financial performance in order to avoid political claims for supplementary credits or lower tax burden. In other words, by concealing the reported surplus of the year *t-1*, finance ministers put public spending as well as the tax burden under pressure between April and December of the year t as graphically demonstrated above. Ultimately, amounts referring to creative accounting operations and reported in year *t-1* reasonably appear to influence the level of public spending and revenues of the year t.

4.2 Impact of creative accounting on governments' financial performance

The use of creative accounting in Swiss cantons is strongly tied to the fiscal policy recommended by the harmonized accounting model for Swiss cantons and municipalities (HAM1) and implemented in most cantonal financial laws. The 4th article of the law concerning the cantons' finance contained in the HAM1 mentions that the statement of financial performance must remain (almost) balanced in the medium-term (CDF 1981: 72). The total operating expenses therefore have to be entirely covered by the total operating revenues. This therefore means that Swiss cantons have to report surpluses during booms in order to compensate past or future deficits. Swiss cantons are thus implicitly recommended to run a structural surplus to avoid the risk of reporting deficits during economic downturns. In other words, by using surpluses to offset past deficits, it would avoid governments deteriorating the net equity.

Nevertheless, it is extremely risky for governments to feature a surplus. Indeed, when a surplus occurs, it actually means that the fiscal pressure was too strong compared to the public services usually provided. Or on the contrary, it means that the provided public services were too weak compared to the State's tax revenues. Because of this, political pressures (coming from the spending ministers, the deputies, the citizens or even from the media) aiming at reducing surpluses can appear. Whereas left-wing political parties might want to increase public spending, right-wing parties would be more willing to decrease fiscal pressure (Tellier 2006). Both cases would result in the dissolution of surpluses. In turn, if such claims were imposed, it would lower the cash flow from operating activities and the possibility to pay off debt. Swiss cantons would therefore face the risk of not being able to ensure a structural surplus in the long run.

Consequently, a finance minister who must legally balance the statement of financial performance or who commit himself to reducing the debt may attempt to restrict these requests in order to maximize the cash flow. Enjoying an information asymmetry relying on better accounting knowledge (Zimmerman 1977; Giroux 1989), finance ministers may have incentives to resort to creative accounting to restrict requests that do not suit their personal

interests. [22]

Notably, possibility is given to finance ministers to play with additional depreciation charges in order to manipulate reported figures towards their own interests. Additional depreciation charges are indeed used by finance ministers for the sole purpose of artificially deteriorating the balance reported in the statement of financial performance. Indeed, such accruals increase operating expenses reported in year *t-1*. That way, by reporting a balanced statement of financial performance, it allows to undercut political claims for higher public spending or tax cuts between March and December of the year *t*. It therefore prompts the maintenance of high tax rates and to put public spending under pressure in the future (at least in year *t*, as graphically demonstrated in the previous subsection). In turn, these high tax rates generate additional cash-flows that allow debt repayment. Aside from additional depreciation, in some cantons, the legislation provides the possibility to play with special funds, that resemble cookie-jar reserves. An allocation to a cookie-jar reserve does not imply disbursement although it increases reported operating expenses. Therefore, such allocation hides surpluses reported in the statement of financial performance in year *t-1* just as additional depreciation charges do; while withdrawal from cookie-jar reserves has the opposite impact.[23]

Our main hypothesize (H1) regarding the influence of creative accounting operations on governments' financial performance is thus as follows: ***By concealing reported surpluses, creative accounting operations like additional depreciation or allocation to special funds allow to avoid claims for tax cuts or public spending increases during the subsequent year. In other words, such accounting operations restrain the level of operating expenses and press for a higher tax burden. Creative accounting operations should therefore improve the real future balance of the statement of financial performance, i.e. increasing even more the real future surplus or***

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[22]Moreover, we may reasonably assume that the greater the information asymmetry, the more incentives the finance ministers will have to resort to creative accounting since other stakeholders lack the necessary information to monitor their action. Indeed, Richardson (2000) demonstrates that *"the greater information asymmetry between management and its shareholders, the more likely the firm is to manage accruals and earnings"*. There is thus no reason that public managers behave differently than managers performing in the private sector.

[23]In the next section, we discuss in detail the notions of additional depreciation charges and special funds. Especially, we pay a particular attention to demonstrate they are not true and fair and therefore are creative accounting operations used in the sole purpose of manipulating the reported balance of the statement of financial performance.

limiting the real future deficit.

4.3 Finance ministers' personal characteristics as determinants of creative accounting

One must first keep in mind that the finance minister has to be differentiated from spending ministers since he is the only one who has a personal interest in sound public finance. Indeed, his prestige and hence his personal benefits (i.e. his reelection chances) mainly rely on his capacity to reach such a target (Hallerberg and Von Hagen 1997). In other words, the level of public deficits and indebtedness, partly ensuing from creative accounting operations, are observed by voters and are used by these latter to assess the incumbent finance minister's performance. That way, the more efficient a finance minister is, the higher his chances are of being reelected.[24] That way, due to their divergent interests, finance ministers may have strong incentives to resort to creative accounting in order to alleviate the spending ministers' appetite for higher public spending and thus ensuring sound public finance.[25] This argument is notably supported by Jiraporn et al. (2008) who read that, in the private sector, *"misalignment of managers' and shareholders' incentives could induce managers to use the flexibility provided by the Generally Accepted Accounting Principles (GAAP) to manage income opportunistically, thereby creating distortions in the reported earnings"*.

In the context of more or less unorthodox accounting practices, it does not appear realistic that the incumbent finance minister will highlight creative accounting operations as a signal to voters to express his competence and therefore to enhance his reelection probability. Quite the contrary. Although such practices are legal in the light of cantonal legislation (at least additional depreciation charges and special funds), they could be questioned by citizens notably since they are in opposition with international accounting standards. Moreover, it cannot be ruled out either that citizens have greater preferences for higher public services

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[24]This point of view is consistent with words maintained by Dafflon and Rossi (1999) who read that *"for a politician seeking reelection the probability of staying in office may heavily depend on his or her budgetary responsibility"*.

[25]Conversely, the reelection chances of the spending ministers and the deputies strongly rely on the financial means they have to implement public policies. That way, if they are also deprieved of funds in the short run, their field of action is automatically reduced and at the same time their reelection chances. This therefore highlights that finance ministers and other stakeholders of the budget process share divergent and discordant interests.

consumption (or lower taxes) in the short and medium term. As such accounting gimmicks deprive them of higher public services (or lower taxes), we may reasonably expect that citizens would reject these practices if they were aware about it. This would therefore certainly lead to lower confidence in the finance minister's behavior and to lower reelection chances.

However, it does not seem realistic that citizens look at additional depreciation charges and cookie-jar reserves to assess the finance minister's competences. It is indeed highly unlikely that the median voter (as well as the media, to some extent) has sufficient accounting expertise to detect these accounting tricks. And even if it were the case, it would also require a strong technical knowledge regarding the concept of "true and fair view" of public accounts to consider these accruals as creative accounting. Almost the same argument may be maintained regarding the finance minister's strategic behavior vis-à-vis the spending ministers and the deputies. Indeed, as previously depicted, the finance minister enjoys an information asymmetry in the budget process that allows him to manipulate the information reported in public figures.[26]

In light of the above, we may reasonably argue that for finance ministers, the cost of resorting to creative accounting (i.e. the probability to be caught by stakeholders of the budget process or citizens) is lower than the cost of not being reelected. For that reason, incumbent finance ministers will resort without any doubt to such practices in order to ensure fiscal soundness and ultimately their position.

Nevertheless, in such a context, everything being equal, it is first of all the probability to report a surplus in the statement of financial performance (see stage 3 in Figure 5) that determines whether or not finance ministers resort to creative accounting. Knowing that the main accounting gimmick at the finance ministers' disposal is asymmetric, i.e. may only be used to artificially increase operating expenses, the occurrence of such a practice is unlikely when a deficit is expected. At the same time, there is strong reason to believe that finance ministers may (only) have incentives to artificially lower reported surpluses since it is expressly recommended by the accounting guideline (HAM1) and most of the

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[26]Somehow, we may assert there is a principal agent relationship between the finance ministers and the deputies as well as the citizens (Brouard 2010). That way, if there is a serious agency conflict (i.e. stakeholders' interests are drastically opposed), we may reasonably assume that finance ministers will resort even more actively to creative accounting operations (Jiraporn et al. 2008).

cantonal financial laws. Moreover, it appears realistic to assume that a finance minister will make every effort to avoid any tax decrease or public spending increase because of the so-called irreversible ratchet effect. That way, in line with the discussion mentioned above, we formulate the second testing hypothesis (H2) as follows: ***This is the probability to report a positive balance of the statement of financial performance that will ascertain the necessity to resort to creative accounting. Moreover, the greater the surplus before reporting, the larger the resort to creative accounting will be.***

The use of accounting gimmicks by finance ministers is thus expected to mainly depend on the government's financial performance, i.e. the probability to report a surplus and also the size of this surplus. Moreover as also already mentioned, finance ministers, independently to their characteristic traits, have the common objective to ensure fiscal soundness if they want to increase their reelection chances. It may hence reasonably be expected that finance ministers, as well as their respective personal characteristics have no incidence on the way to manage public finance. In other words, it would be the position and the tasks to be fulfilled that would lead the finance ministers' behavior. As a consequence, all of them should embrace the same strategy as for their use of creative accounting.

Nonetheless, this approach may also be contested since there is a growing evidence that particular public policies are deeply spread through the decision-makers' influence (president, prime minister, finance minister, central bankers, etc.). We may thus first wonder whether finance minister's political ideology matters. We may indeed expect that the political ideology is seen by citizens as a proxy for the politicians' competence. This is particularly true in coalition governments where left-wing ministers are generally in charge of social affairs, environment and culture whereas right-wing ministers are mainly responsible for the ministries of economy or finance. Consequently, we may reasonably assume that left-wing finance ministers could be seen as less competent (i.e. less able to avoid public deficits) than right-wing ones since they have to take charge of a ministry which is not in their usual bosom. It therefore appears all the more essential for left-wing finance ministers to reach fiscal soundness since they presumably suffer a lack of confidence from citizens. That way, probably conscious of this lack of confidence, left-wing finance ministers could have stronger

incentives to resort to creative accounting in order to report a better financial performance. This would constitute a reassuring signal sent to electors in order to ensure their reelections. In accordance with the recent findings of Chatagny (2013) who pays attention to the tax revenue budgeting errors, the hypothesis regarding the impact of the finance minister's political ideology on the use of creative accounting (H3) is as follows: *In order to make sure they will achieve fiscal soundness, left-wing finance ministers would resort more actively to creative accounting (i.e. would accumulate more money through the use of additional depreciation charges and special funds) than right-wing ones.*[27]

The political experience may also be, without any doubt, a key determinant of the finance minister's behavior and of his way of managing public finance. The literature has besides demonstrated that policians' experience may influence fiscal outcomes (e.g. Feld and Schaltegger 2010). Regarding our field of interest, more experienced finance ministers are expected to be more comfortable with accounting practices and more aware about all the gimmicks at their disposal to manipulate public figures. Moreover, a more experienced finance minister should be more aware of political snares and therefore should have higher capacities to cope with them. Such a political experience should therefore allows finance ministers to increase the information asymmetry existing between themselves on the one side and the spending ministers (as well as other stakeholders) on the other side. The hypothesis impact of political experience on the use of creative accounting (H4) may be formulated as follows: *Finance ministers with a greater tenure are expected to possess deeper knowledge than inexperienced ones, what should provide them greater capacities to resort to creative accounting. More experienced finance ministers are therefore expected to be associated with higher amounts of creative accounting.*

Finally, attention is paid to finance ministers' educational background. According to our point of view, it is reasonably arguable to consider that education may affect the people's identity. Consequently, the finance minister's behavior would be, at least partially, led by his

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[27]This hypothesis is also in line with the results of Hendrick (2006) who demonstrates that more left-wing governments are in general more risk averse and therefore accumulate more reserves in order to be able to cope with unexpected events.

own beliefs and convictions accumulated through his training.[28] In this study, although we control for several sort of training, we expect that trained economists are more reluctant to report public deficits than other finance ministers. That way, they would be more willing to make everything possible to avoid such situations. Furthermore, trained economists are supposed to have a stronger expertise in accounting what should provide them greater abilities to manipulate reported figures. Better knowledge in accounting also supposed a greater information asymmetry between the finance minister and the spending ministers. The hypothesis surrounding the expected effect of the finance minister's educational background (H5) may thus be formulated in this manner: ***An education in economics should strengthen the finance ministers's aversion for public deficits and improve his knowledge in accounting. Finance ministers having a university degree in economics are thus expected to be associated with higher amounts of creative accounting.***

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[28]For instance, Chwieroth (2007), Jochimsen and Thomasius (2014) and also Moessinger (2012) provide evidence as to the influence of policians' education background on diverse fiscal outcomes.

5 Main Accounting Elements

In the current section, we offer a discussion about the Harmonized Accounting Model for Swiss cantons and municipalities. Mainly, we present the cantonal chart of accounts, as well as the similarities and differences with IPSAS since both are accrual-based accounting models. Finally, after having provided a new definition of creative accounting, we present both accruals we consider as being the two main accounting tricks used by Swiss cantons in detail.

5.1 Introduction

For a long time, several public accounting systems coexisted in Switzerland at the cantonal level. Thus, it is, among other things, the need of harmonization at the end of the 1970's that pushed the Conference of Cantonal Finance Ministers (CDF) to express a recommendation for the Swiss cantons and municipalities.[29] This recommendation is expressed through a public accounting handbook (CDF 1981) and is now known by the abbreviation HAM1 for Harmonized Accounting Model of the first generation. This appellation reflects reality as the financial statements of Swiss cantons and municipalities went through a movement of harmonization for the first time. Nevertheless, the HAM1 is only a recommendation. The Conference of Cantonal Finance Ministers does not have the power to impose its decisions on Swiss cantons. The implementation of the HAM1 is consequently very laborious. Every canton has to introduce the recommendations of the CDF into its own financial laws in order for those recommendations to have legal force. On the one hand, the introduction is not always faithful to the recommendations. Thus, some disparities may exist between Swiss cantons relative to certain norms. And on the other hand, the HAM1 implementation largely depends on the political agenda of each canton and municipality. For these reasons, one must wait until the end of the 1990s for every canton to apply the HAM1 in one form or another.

The HAM1 provides a presentation of the public accounting handbook that contains a long list of norms, principles and objectives. Then, the HAM1 also presents a chart of accounts

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[29]Each Swiss canton has, among the members of the cabinet, a "minister", a "state councilor" or an "executive councilor" in charge of finance. That way, the 26 members of cabinets in charge of finance gather at this conference in order to coordinate cantonal requests and defend their interests towards the Federal State.

and a model-law for cantonal finance. Among the principles discussed in the accounting handbook, the following may be considered fundamental. As we previously mentioned, one of the main objectives of the HAM1 for Swiss cantons was to harmonize the framework of cantonal and municipal finance. This willingness to harmonize should allow observers to perform precise comparisons across cantons. At the same time, the HAM1 should allow for better control, management and decision support for financial analysts, and it could be used as a tool for forecasting (CDF 1981: 6).

5.2 HAM1, the Swiss accrual-based accounting model

One of the most fundamental changes supplied by the New Accounting Model was the implementation of accrual accounting instead of cash-basis accounting. Accrual accounting has been preferred because it is supposed to increase transparency inside the administration. Transparency is a fundamental issue since it should increase the managers' accountability and improve the decision-making process, which in turn should help a better organizational performance and resource allocation. Furthermore, accrual accounting allows to identify the full costs of public activities more accurately. This should allow Swiss cantons to pave the way for the *user pays principle* inside as well as outside the public administration (CDF 1981: 79). Thus the HAM1 should develop *a cost-based way of thinking* in the administration, notably through the use of internal service charges.[30] Hence, one must keep in mind that the HAM1 is strongly inspired by an economic approach of public finance. Besides, it is a key element of accrual accounting. To some extents, this economic approach of public finance surrounding the HAM1 tightly converges the *true and fair view* of the financial status currently recommended by the IPSAS norms.

Simultaneously, the HAM1 and IPSAS mostly share a similar presentation of financial statements. Indeed, it is mostly the name of the different statements used within the HAM1 rather than the content of these that is unusual. The main particularity of the HAM1 relies

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[30]The internal service charges allow recording of the exchange of goods and services within an administration. The equivalent of the service is credited as revenue in the department providing the service; it is credited as an expense in the department receiving the service. Such internal service charges entries are purely and only book entries. The internal service provision neither generates nor drains cash.

on the crucial distinction between the statement of financial performance and the statement of investments.[31] This distinction comes from the fact that some public spending are only used for one year; they are operating expenses. Conversely, some other public spending are used over several years to purchase the infrastructures providing public services; they are investment (or capital) expenditure. Thence arises the question of how to finance these two types of public spending. Should they be financed in the same way or not? To respect the user pays principle, both types of public spending must have two distinct funding sources. Indeed, future generations will also enjoy the usefulness of the investment expenditure. This means they will also have to bear the cost of these investment expenditure, by taking on depreciation charges and the costs of debt. One might therefore consider the statement of investments as a sort of balance sheet account since the investment expenditure are registered as assets. On the other hand, the statement of investments registers subsidies that principally refer to revenues coming from the Federal government. Moreover, we have to underline that assets are split into two categories: the administrative assets and the non-administrative assets. In short, administrative assets are those used and indispensable to accomplish public policies. Conversely, non-administrative assets are not used to accomplish public policies. Indeed, governments use them in order to produce additional revenues. The HAM1 recommends using the criteria of *alienability* to distinguish both categories of assets. Consequently, if a canton can sell one of its assets without altering the implementation of its public policies, the asset must be considered as a non-administrative asset. Finally, the statement of financial performance refers to all operating expenses (wages, supplies and consumables used, interest costs, etc.) and operating revenues (tax revenues, royalties and concessions, financial income, etc.) of Swiss cantons.

Figure 6 shows how Swiss cantons have to close annual accounts according to the HAM1.

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[31]Both notions are translated from French by the Federal Finance Administration (FFA) and presented in the New Accounting Model (NAM) for the Swiss Confederation (FFA 2008). In the rest of the section, we mainly use the IPSAS terminologies. However, for the Swiss particularities, we sometimes resort to the definitions provided by Bergmann (2009) when they are not available in the NAM.

Figure 6: Graphical presentation of the Harmonized Accounting Model

Source: CDF (1981), FFA (2008), Bergmann (2009) and own adjustments.

First of all, governments have to close the statement of investments. The balance, called the net investment, corresponds to the difference between the investment expenditure and the subsidies coming from the Federal government. It indicates the part of the investments that Swiss cantons have to bear with their own financial means. The closing of the statement of financial performance highlights the cash-flow from operating activities. The cash-flow from operating activities is defined as the sum of the balance of financial performance (surplus or

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deficit) and the depreciation charges of the administrative assets.[32] This amount refers to the financial means at the cantons' disposal to finance the net investment. If the cash-flow from operating activities is smaller than the net investment, the canton has to borrow on the capital markets in order to finance the difference. This step corresponds to the closing of the statement of financing. Finally, we can gather previous operations into the statement of financial position (i.e. commonly known as the balance sheet). As we can see, investment expenditure increase public assets, whereas the subsidies and the depreciation charges (of the administrative assets) are recorded as a reduction of the investment expenditure. Then, borrowing increases the liabilities while the balance of the statement of financial performance (in a case of a surplus) increases the net equity.

Here, Figure 6 schematizes the case of a canton achieving a surplus of the statement of financial performance and a deficit in the statement of investments (i.e. a positive net investment). In that case, the canton only finances a part of the net investment through debt. Finally, the positive balance reported in the statement of financial performance increases the net equity and borrowing increases liabilities.

5.3   Towards a new definition of creative accounting

Unlike IPSAS norms, the HAM1 does not only settle for an accounting model but also provides rules for policy guidance. The simultaneous inclusion of the accounting model and of these rules for policy guidance is hardly compatible in the Swiss context. Indeed, two mutually exclusive visions of public finance fight each other in the HAM1. On the one hand, the *economic* vision focuses on the true and fair view of financial figures and therefore embraces the IPSAS philosophy and, on the other hand, a more *political* vision focuses on fiscal policy tends to violate the IPSAS philosophy. The political vision mostly lies in the valuation of public assets. Regarding this issue, the HAM1 does not reflect a true and fair view. Instead of considering the lifespan of public assets in order to fix depreciation rates, the HAM1 recommends Swiss cantons resort to a relatively short depreciation duration. According to Bergmann (2009), two thirds of the value of a building are depreciated within

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[32]The way Swiss cantons measure the cash-flow from operating activities is tightly similar to the indirect method proposed by the IPSAS norms (i.e. IPSAS recommendation 2 - cash-flow statements.)

the first ten years or about 90% within twenty years, which is certainly more than the recommendations formulated by the IPSAS board (IFAC 2002).[33]

As already mentionned above, the balance of the statement of financial performance (SPER-balance) is a crucial element for Swiss public accounting. Indeed, it determines the change in cantonal net equity. While a surplus increases the net equity or decreases the indebtedness, a deficit decreases the net equity or increases the indebtedness. As the SPER-balance determines the change in debt, the political debate (from the budget preparation to the reporting process) is principally focused on this balance. At the same time, politicians are all the more focused on the SPER-balance since the media also concentrates on it. Consequently, finance ministers may have strong incentives to put the statement of financial performance under pressure in order to restrain operating expenses and therefore the indebtedness. This is obviously the objective behind the high depreciation rates recommended by the HAM1 and by most of the cantonal financial laws. Indeed, while depreciation charges are not available for discretionary political decisions, surpluses are in the hands of politicians. That way, while reporting relatively high amounts of ordinary depreciation charges does not alter both the cash-flow from operating activities and the investment capacity, it prevents tax cuts and/or operating expenses increases. Conversely, lower ordinary depreciation charges could possibly reduce available cash-flow for future investments. In other words, resorting to relatively high amounts of ordinary depreciation charges ensures both investment capacity, as well as a structural surplus over time.

Nevertheless, if high ordinary depreciation rates are not sufficient to avoid political debates about the reported balance of the statement of financial performance, finance ministers still have opportunities to discretionarily play with more or less unorthodox accounting operations in order to manipulate reported public figures. Among these operations, some of them may be assimilated to creative accounting. In this research, without leaving behind the legal perspective of the accounting behind, we embrace the economic vision of public finance supported by the IPSAS norms and tackle the economic reality of accounting operations

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[33]Then, in addition to violating the true and fair view of governments' financial position, such high depreciation rates also cause intergenerational problems regarding the financing of public infrastructures. Indeed, instead of spreading the costs of public assets over time in order to respect the "user pays" principle, it is the generation who decides to invest that finances the largest part of the asset.

performed by finance ministers. That way, in order to justify and defend our choice as to the operations we consider as accounting gimmicks, we propose a new definition of creative accounting, which is expressed as follows:

In jurisdictions having implemented accrual accounting standards, creative accounting notably refers to discretionarily used accruals, that have no economic reality and therefore that violate the true and fair view of public figures with the sole purpose of misleading stakeholders of the public policy-making process.

When looking at the HAM1, it emerges that at least two main accounting operations suit the above mentioned definition and therefore can be suspected to be used by finance ministers in order to manipulate the reported balance of the statement of financial performance. These operations, that are both accruals, are the additional depreciation charges and the operations on special funds. As already mentioned, accruals do not generate cash-flow nor cash-drains and are thus more easily manipulable. For that reason, since accruals offer more flexibility than other book entries, it is not surprising that finance ministers mainly play with them in order to disguise public figures. Moreover, the existence of creative accounting (or at least the fact that some accounting practices are in opposition to IPSAS norms) is mainly due to the fact that people who produce the accounting information in Swiss cantons are mostly the same that prepare accounting standards (i.e. the HAM1); they are the finance ministers. Furthermore, since there is almost no counter-power, finance ministers have all the leeway they need to shape accounting standards according to their own interests. Therefore, there is probably a legitimacy problem (or at least a governance problem) regarding the authority developing accounting standards in Swiss cantons.

In addition to be commonly known as famous accounting tricks used in Swiss cantons, we focus on additional depreciation charges and operations on special funds since information is easily available. Indeed, a particular accounting entry is devoted to both accruals in the statement of financial performance. That way, it could not be easier to find additional

depreciation charges and special funds amounts.[34] In other words, while theoretical reasons persuaded us to pay particular attention to both accruals, the availability of the data also reinforces our opinion. Moreover, as additional depreciation charges and operations on special funds are fully discretionary, amounts reported in the statement of financial performance may directly be considered as creative accounting. It therefore avoids us using more or less sophisticated econometric methodologies to disentangle the discretionary part of accounting operations.[35] Finally, more detailed information regarding both accounting tricks is given in the next two subsections.

5.4 Additional depreciation charges

Additional depreciation charges in light of the HAM1

Comparatively to ordinary depreciation charges, additional depreciation charges are also depreciation charges of administrative assets.[36] This proves that the political and fiscal vision promoted by the HAM1 strongly relies on and is achieved through the valuation of public assets. Nevertheless, unlike the ordinary depreciation charges that have to be reported each year because of the wear and obsolescence of public infrastructures, the accounting handbook for Swiss cantons reads that additional depreciation can be budgeted during economic expansions in order to pay off debt (CDF 1981: 13). However, there is no economic justification for reporting depreciation charges according to the business cycle, i.e. the obsolescence of public assets does not increase during economic expansion.[37] It is also stipulated that additional depreciation charges do not have to be used to finance new investments. This means that even though additional depreciation charges allow for increased cash-flow from operating ac-

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[34]For instance, as debated in the last subsection below, provisions are also known as being largely used by finance ministers in order to manipulate reported public figures. However, conversely to additional depreciation charges and operations on special funds, information regarding those provisions is not easily available since no particular accounting entry is devoted to this accrual in the statement of financial performance.

[35]For detailed explanations regarding sophisticated econometric methodologies, we recommend paying attention to Healy (1985), DeAngelo (1986) and Jones (1991).

[36]The additional depreciation charges represent a different accounting entry to the ordinary depreciation charges, although they are both depreciation charges of administrative assets. According to the chart of accounts included in the HAM1, the ordinary depreciation charges of administrative assets' accounting number is 331. Then, the accounting number for the additional ones is 332. For more details, Appendix A presents the chart of Swiss cantons' accounts.

[37]In other words, even though ordinary depreciation charges do not fully follow the true and fair lifespan of public assets, their use is constant over time. Consequently, this is the discretionary characteristics of the additional depreciation charges that persuade us to consider these latter as a pure and simple creative accounting operation.

tivities, this cash-flow cannot be used to acquire new assets. In fact, the HAM1 emphasizes the importance of not accumulating new assets in a period of favorable conjuncture in order to maintain greater cash-flow from operating activities than the net investment. Indeed, it is by generating a surplus in the statement of financing, that a canton provides itself with the financial means to repay debt.

Additional depreciation charges in light of cantonal financial legislation

However, as previously mentioned, the HAM1 is simply a proposal and it has to be transposed into cantonal financial laws in order to have legal force. Noticeable gaps may thus appear between the recommendations formulated in the HAM1 and their transcriptions in cantonal financial laws. This is the case for additional depreciation charges, as reported in Table 1 below. This table reports the type of legal rule surrounding the use of additional depreciation charges in each canton. In the light of the 26 cantonal financial laws, rules dealing with additional depreciation charges may be classified in three distinct categories. Whereas the first and the second category of laws indicate that the resort to additional depreciation is "possible" or "mandatory" respectively, the third category refers to cantonal legislation including "no indication" regarding the use of additional depreciation charges.

Table 1: Regulation of additional depreciation charges in cantonal legislation

Possible	Mandatory	No indication
BL; FR; GL; NW; OW; SH; SZ; TI; UR; ZG	BE; SO; VS	AG; AI; AR; BS; GE; GR; JU; LU; NE; SG; TG; VD; ZH

Source: Cantonal financial laws and own investigations

According to information reported in Table 1 above, the way in which additional depreciation charges are ruled by cantonal financial laws seems to be relatively heterogeneous. Out of the 26 Swiss cantons, the legislation in 13 of them has no indication as to the use of additional depreciation charges. 10 other cantons offer the possibility to report additional depreciation but only under particular circumstances. Indeed, as stipulated in the financial law of the canton of Obwald (OW), *"additional depreciation charges are authorized as far as*

the financial and economic situations allow it".[38] Finally, it is explicitly stipulated that the resort to additional depreciation charges is mandatory during times of economic expansions in only 3 cantonal financial laws. For instance, the financial law of the canton of Valais (VS) stipulates that *"additional depreciation charges on administrative assets have to be reported as far as the financial and economic situation allows it".*[39]

The use of additional depreciation charges therefore appears to be relatively flexible in Swiss cantons. Cantonal financial laws are sometimes so imprecise that enough leeway is offered to interpret them according to ones own interest. Lot's of room is given to the threshold to which additional depreciation charges can or have to be used in Swiss cantons. There is no accurate indication as to how to interpret *"as far as the financial and economic situationallows it"*. That way, in addition to not always being in line with the recommendations formulated in the HAM1, there is every reason to believe that the use of additional depreciation charges may differ among cantons with regards to the strong heterogeneity of cantonal financial laws.

Additional depreciation charges as accounting gimmicks

Evidence is therefore provided that additional depreciation charges must be seen as a policy tool controlled by finance ministers aiming to artificially increase operating expenses and deteriorate the reported balance of the statement of financial performance. This is exactly how they are described in the new Harmonized Accounting Model for cantons and municipalities (CDF 2008: 148).[40] The additional depreciation charges would then be used in the

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[38]Source: Finanzhaushaltsgesetz vom 11 März 2010, Art. 24; al. 2.

[39]Source: Loi sur la gestion et le contrôle administratifs et financiers du canton du 24 juin 1980, Art. 14, al. 4.

[40]The new Harmonized Accounting Model (HAM2), developed in 2008 by the Conference of the Cantonal Finance Ministers (CDF), is the revised version of the HAM1. This new accounting handbook for Swiss cantons and municipalities is widely based on the IPSAS norms. In spite of everything, the tradeoff between the economic and political visions of accounting still persisted during the making of HAM2. Just to show, some finance ministers were even completely opposed to the inclusion of additional depreciation charges in the HAM (NLZ 2014). Finally, an alternative solution has been reached. In the end, the HAM2 reads that *"As a compromise between the solution required by IPSAS norms and the traditional depreciation embracing the principle of prudence, both categories of depreciation charges are acceptable for administrative assets. Nonetheless, both categories have to be distinctively separated into ordinary and additional depreciation charges. [...]. Additional depreciation charges as instruments of the budgetary policy are admissible. They have to be reported as exceptional expenses in order for them not to apply any influence on the reported balance of the statement of financial performance"* (CDF 2008: 66). The latest argument therefore clearly demonstrates that additional depreciation charges have been used as an accounting gimmick in Swiss cantons in the scope of the recommendations formulated in the HAM1.

sole purpose of maintaining fiscal pressure on citizens and to avoid political pressures aiming at increasing public spending. At the same time, additional depreciation charges increase the cash-flow from operating activities, which decreases the canton's need to borrow and so contains the debt increase.

It is therefore obvious that additional depreciation charges have no economic reality since they go beyond the actual wear and tear and obsolescence of assets. Such evidence is even reported in newspapers. Le Nouvelliste notably, when citing the finance ministers of Valais, reads that *"2011 accounts include additional depreciation charges for 118.1 millions CHF. This refers to depreciation charges having been recorded beyond the strict necessary"*.[41] That way, additional depreciation charges constitute a hidden reserve because they artificially lower the book value of administrative assets. Moreover, they are discretionarily manipulated without any regard to the lifespan of public assets. For that reasons, such additional depreciation charges have to be considered as creative accounting since they violate the true and fair view of public figures (i.e. they simultaneously artificially decrease the surplus reported in the statement of financial performance, as well as the value of public assets).

Furthermore, additional depreciation charges are an asymmetric tool since they may only be used to hide a surplus of the statement of financial performance. Indeed, hidden reserves created through the use of additional depreciation charges cannot be dissolved in order to offset a deficit (or the improve a surplus). As administrative assets cannot be sold because of the principle of *alienability*, such hidden reserves can only increase over time (SRS 2011: 1).

The disclosure of additional depreciation charges in public accounts

Figure 7 on the following page schematizes a case where a surplus of the statement of financial performance is hidden by increasing the amount of additional depreciation charges. At the same time, we consider the same case as presented earlier, i.e. a case where a canton has to borrow money in order to finance a part of the net investment. As observed in the basic case previously presented, investment expenditure increase the amount of assets, whereas ordinary

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[41]Source: Le Nouvelliste (03.04.2012) Des poires pour la soif ont été prévues

depreciation charges and the subsidies come in deduction of the assets. Then, the additional depreciation charges are also accounted negatively on the assets' side of the statement of financial position. Finally, the borrowing increases liabilities.

Figure 7: Graphical presentation of the HAM1 in the presence of additional depreciation charges

Source: CDF (1981), FFA (2008), Bergmann (2009) and own adjustments.

5.5 Special funds

Special funds in the light of the HAM1

The resort to additional depreciation charges, however, is not the only tool that Swiss cantons have at their disposal to manage the picture of the governments' financial situation. Although they are strictly forbidden by the HAM1 (CDF 1981: 37), cookie-jar reserves can be created, particularly through the use of special funds. The HAM1 reads that *"special funds correspond to the total or partial allocation of specific revenues to particular tasks. Special funds are normally only created in sectors where a causal relationship can be established between the task to be fulfilled and the direct payments obtained by the beneficiaries (e.g. a parking fee or tax)"* (CDF 1981: 13). In addition, it would be best to *"keep reserves or special funds to a minimum, in order to preserve surpluses facing overall excess of expenses. Indeed, deficits and debt should be covered by net equity or additional depreciation charges"*. Furthermore, *"special funds may, however, be used to provide funds for future tasks so that ulterior political decisions can be rapidly implemented"* (CDF 1981: 70). Nonetheless, *"when the special fund goals no longer exist or cannot be reached, governments will then have the responsibility to cancel them"* (CDF 1981: 69).

Special funds in light of cantonal financial legislation

Noticeable gaps may also be seen between recommendations formulated in the HAM1 and their transposition in cantonal financial laws. Moreover, as reported in Table 2 below, the extent to which the use of special funds and funds for future tasks, as well as their financing mode are regulated strongly differ between Swiss cantons.

Table 2: Regulation of special funds in cantonal legislation

Special funds	Funds for future tasks	Mode of financing
AG; AR; BE; BL; FR; GE; GL; GR; JU; NE; NW; OW; SG; SH; SZ; TG; TI; UR; VS; ZG	FR; NW; OW; UR; VS; ZH	GE; GL; JU; NW; OW; SH; TG; UR

Source: Cantonal financial laws and own investigations

In a general manner, the question of special funds is vaguely treated by financial laws in

Swiss cantons. Notably, in 20 Swiss cantons, without explicitly indicating whether the use of special funds is authorized, cantonal legislation mostly settles for providing a definition. For instance, the financial law of Fribourg (FR) states that *"special funds are financial means attributed by the law or a decree to the accomplishment of a determined public task"*[42] Furthermore, the use of funds for future tasks is hardly ever regulated in Swiss cantons. Indeed, only 6 financial laws deal with this issue. Finally, only 8 out of the 26 Swiss cantons have legislated as to the mode of financing of special funds, indicating that tax revenues should not be used to bail out special funds. For instance, the cantonal financial law of Jura (JU) stipulates that *"general tax revenues cannot be reserved for particular tasks, except for specific parts"*.[43]

Special funds as accounting gimmicks

It appears that special funds may be discretionarily used in order to manipulate the balance reported in the statement of financial performance.[44] Both HAM1 and cantonal legislation seem to offer a relatively high flexibility as to the use of these funds. For instance, how could we not question amounts allocated to special funds devoted to future tasks when no clear criteria is defined regarding the object to be financed? What justifies a certain amount of public money being allocated to one of those funds when the prospective future projects that will be implemented thanks to those funds are not defined? This basic reflection makes us doubt the fairness of special funds and therefore their economic reality. There is strong evidence suggesting that special funds are discretionarily bailed out in the sole purpose of hiding reported excess revenues; future projects being only a pretext to do so. In the same way, special funds may be discretionarily bailed out according to the reported balance of the statement of financial performance since their mode of financing is almost unregulated in Swiss cantons. For instance, Le Nouvelliste revealed that the surplus of 2011 in the canton of Valais was partially allocated to special funds for future (unknown)

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[42]Source: Loi du 25 novembre 1994 sur les finances de l'Etat, Art 16, al.1.

[43]Source: Loi sur les finances cantonales du 18 octobre 2000, Art.4, al.1.

[44]Nevertheless, contrary to additional depreciation charges, the use of special funds is symmetric. Indeed, while special funds may be bailed out in order to report downward SPER-balance, special funds may also be debited in order to provide a better picture of the financial situation.

tasks. According to the finance ministers of the Valais, *"it is money that could be used in the coming years"*.[45] Moreover, at the cantonal level, no public service relies on the *user pays* principle. In other words, to the best of our knowledge, there is no causal relationship between particular tasks to be fulfilled and a direct payment obtained by the beneficiaries. Thus, we may reasonably suspect that special funds have no economic consistency, they may be discretionarily manipulated and that seems to not be in line with the recommendations of the HAM1, at least partially. Therefore,we consider these accounting operations as creative accounting.[46]

The disclosure of special funds in public accounts

Table 8 below presents a case of Swiss cantons deciding to allocate money to special funds.

In the case of a surplus, the amount allocated to special funds can be increased in order to hide excess operating revenues. This operation will simultaneously increase operating expenses, reduce the reported balance of the statement of financial performance and increase the canton's net equity. In that case, on the contrary to additional depreciation charges, the amounts allocated to special funds are reported on the liabilities side of the statement of financial position, in the equity.

5.6 Other manipulations

Although this research only focuses on additional depreciation charges and special funds, some other accounting gimmicks could eventually be used in Swiss cantons in order to manipulate the balance reported in the statement of financial performance. To the best of our knowledge, even if we do not consider providing an exhaustive list, it is strongly conceivable that the following tricks could be frequently used in Swiss cantons.

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[45]Source: Le Nouvelliste (03.04.2012) Des poires pour la soif ont été prévues
[46]Our point of view is besides widely supported by most of the experts we interviewed, as exposed in section 6.

Figure 8: Graphical presentation of the HAM1 in the presence of special funds

Source: CDF (1981), FFA (2008), Bergmann (2009) and own adjustments.

First of all, on a comparable basis to special funds, provisions could be used to create cookie-jar reserves. In the HAM1, it is actually sayd that *"provisions are used at the end of the year to determine the unknown amount of expenses and expenditure caused by deliveries or services that have already been fulfilled"*. Then, the accounting handbook adds that *"provisions related to future deliveries or services that have not already been fulfilled are described as fictive and considered as reserves. So that comparisons between cantons are possible and because surpluses have to be affected to the net equity, such reserves are prohibited"* (CDF 1981 : 37). Moreover, the assessment of these accruals is very much open to interpretation and leaves room for the authorities to manipulate them at their discretion. Finance ministers are then capable of recording an artificially high amount of provisions to hide surpluses.[47] That way, provisions may have no economic reality and be used in the opposite way to rules prescribed in the accounting handbook. Consequently, in some particular cases, they may be considered as creative accounting.

Then, as previously indicated, Barnea et al. (1976) and Beattie et al. (1994) acknowledge that private sector organizations can play around with the classification of some accounting elements to apply income smoothing. In fact, when balances appear to be better than forecasted, firms can choose to write down exceptional expenses as ordinary expenses in their accounts. On the other hand, some ordinary accruals may be written down as extraordinary ones in order to artificially enhance balances. Furthermore, Hepworth (1953) mentions that firms can also toy with the distinction between operating expenses and investment expenditure. Even if the difference between ordinary and extraordinary items does not exist in the HAM1, the possibility of playing with the nature of public spending is also provided. Indeed, the harmonized accounting guidelines distinguish operating expenses from investment expenditure. Investment expenditure is defined as *"spending which must belong to administrative assets, must induce new or enhanced value to the community and its members, whether it be qualitative or quantitative, and must be useful over many years"* (CDF 1981 : 33). On the other hand, operating expenses are only consumption spending. Nevertheless, in reality, cantons use monetary criteria to determine whether or not public spending

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[47]As revealed by McNichols and Wilson (1988), the same operations are practiced in the private sector as some firms record large amounts as provisions for credit losses in order to decrease unusually high profits.

should be activated. Spending will therefore be recorded as investment expenditure only if its amount is above an activation threshold previously determined by the canton. Moreover, these activation thresholds vary widely across cantons. That way, since the monetary criterion prevails, finance ministers can use their own discretion to decide to activate a particular spending, mainly according to the economic situation. When surpluses are expected to be high, investment expenditure could be recorded as operating expenses in order to disguise the surplus of the statement of financial performance. Again, by hiding surpluses, a strong fiscal burden is maintained and operating expenses are put under pressure. Moreover, recording investment expenditure as operating expenses allows Swiss cantons to reduce their future operating expenses. Since the investment expenditure has been recorded as an operating expense, the canton will not bear the weight of depreciating this investment. Simultaneously, such operations raise the total amount of hidden reserves as the administrative assets are underestimated. Then, when surpluses of the statement of financial performance are expected to be lower than forecasted, the opposite phenomenon could occur.

We can also briefly mention that Swiss cantons may play around with the recognition of operating revenues and operating expenses in order to smooth the reported balance of the statement of financial performance.

In conclusion, even if the recommendations formulated in the HAM1 forbid the creation of cookie-jar reserves, many tools are available in order to achieve this particular goal. According to various authors, creative accounting is most often used within GAAP. As mentioned by Healy and Wahlen (1999), the accounting standards leave a lot of flexibility for the manager's interpretation. These managers therefore have the possibility to display results, that may not be a perfect image of the firm, without resorting to fraudulent manipulations. It is thus at the finance ministers' discretion to create cookie-jar reserves using various tools, without ever disobeying the HAM1 or the cantonal financial laws. Nevertheless, although finance ministers do not perform illegal accounting operations, these operations have no economic reality and violate the true and fair view of public figures. Therefore, these kind of accounting gimmicks have to be considered as creative accounting.

6 Quantitative importance of creative accounting in Swiss cantons

In order to measure the importance of creative accounting in Swiss cantons and to test our two main hypothesis, we had to collect accounting information and data concerning the 26 Swiss cantons over the period 1980 - 2012. First of all, data concerning operating revenues and operating expenses was compiled in order to calculate the balances of the statement of financial performance (SPER-balance) for the considered period. For the same period, we gathered the reported data concerning the additional depreciation charges, as well as the special funds. Moreover, since we are also interested in tackling the role played by finance ministers in the use of creative accounting operations, we also collected information relative to the 116 finance ministers having been in position between 1980 and 2012. Specifically, we paid particular attention to some of their personal characteristics, such as their political ideology, their experience as finance minister and their educational background.

In this section, we first present descriptive statistics relative to creative accounting operations performed in Swiss cantons. Then, we provide statistics regarding reported and corrected SPER-balances. Since we have reported public figures and data relative to creative accounting operations at our disposal, we can display the corrected SPER-balances, i.e. the balance of the statement of financial performance cleaned of additional depreciation charges and operations on special funds. Finally, we end the statistical analysis by reporting the creative accounting operations in the light of the finance ministers' personal characteristics.

One must first bear in mind that figures presented below are expressed in real terms per capita. Working with real values allows us to control for inflation. As an individual deflator for each canton does not exist, we work with the implicit Swiss GDP deflator to obtain real values.[48] Finally, since Swiss cantons are relatively heterogeneous and in order to make clear comparisons, financial data is expressed per capita.

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[48]Source: Swiss Federal Statistical Office (SFSO). Deflator 2012 = 100%.

6.1 Quantitative importance of additional depreciation charges

In order to empirically test our hypothesis, it is needed to chose an appropriate measure for the additional depreciation charges. In this research, our main variable of interest is expressed as follows:

$$ADC_R = \frac{Depreciation_R}{P}$$

where $Depreciation$ refers to the total amount of additional depreciation charges reported in the statement of financial performance and $_R$ notifies reported figures. Finally, P is the canton's population.

Table 3 reports the usual summary statistics concerning the additional depreciation charges per capita (ADC) for each Swiss canton over the considered period. Additionally, the column "N" indicates the number of years during which each canton applied the recommended accrual-based accounting model and the column "Occurrence" reports the occurrence of additional depreciation charges (N $\geq$ Occurrence). The cantons are ranked in descending order based on the average additional depreciation charges.

23 Swiss cantons record additional depreciation charges at some point over the period. However, the Table exhibits strong heterogeneity among these cantons. The canton of Uri (UR) charged 572.09 CHF per capita on average compared to the canton of Zürich (ZH) which charged an average 2.40 CHF per capita. The canton of Uri (UR) seems to be quite an extreme case since the second canton - the canton of Zug (ZG) - only charges 292.71 CHF per capita on average. Standard deviations together with minima and maxima and the occurrence also indicate a strong intertemporal variability. Furthermore, in order to point out this variability over time, we present the average annual amount of additional depreciation charges for the considered period in Table 22 of Appendix B.

Table 3: Additional depreciation in real terms per capita (1980 - 2012)

Canton	N	Mean	Std. dev.	Min	Max	Occurrence
UR	29	572.09	638.74	0.00	2'827.58	18
ZG	33	292.71	192.55	0.00	767.64	30
NW	33	266.64	376.11	0.00	1'563.19	22
GR	25	185.90	480.96	0.00	2'444.80	14
AI	33	167.05	161.67	0.00	782.28	27
OW	27	160.22	198.95	0.00	718.41	17
SZ	26	138.04	100.12	17.04	374.05	26
BE	26	129.60	190.82	0.00	551.09	21
BL	32	97.95	200.98	0.00	944.16	27
VS	30	88.78	146.67	0.00	408.48	9
SH	23	74.97	139.16	0.00	574.86	11
SO	31	74.41	165.13	0.00	821.57	15
GL	33	73.20	153.19	0.00	649.92	11
TI	33	66.32	210.65	0.00	903.87	5
GE	27	65.51	340.39	0.00	1'768.71	1
LU	25	48.03	61.63	0.00	210.28	17
AR	33	44.52	204.04	0.00	1'175.75	11
VD	33	43.67	98.69	0.00	473.39	11
TG	31	28.97	104.63	0.00	564.69	12
JU	33	21.32	57.61	0.00	263.76	6
FR	17	14.72	60.71	0.00	250.30	1
AG	18	4.03	9.02	0.00	27.23	6
ZH	31	2.40	5.60	0.00	16.35	5
BS	18	0.00	0.00	0.00	0.00	0
SG	16	0.00	0.00	0.00	0.00	0
NE	33	0.00	0.00	0.00	0.00	0
Mean		102.35	165.31	0.66	733.94	12

Source: Swiss cantons' statement of financial performance and own calculations

6.2 Quantitative importance of special funds

Once again, in order to empirically test our hypothesis, it is needed to operationalize our variable of interest. Here, while additional depreciation charges are asymetric, i.e. may only be used to artificially increase operating expenses, special funds may artificially increase both operating revenues and operating expenses. That way, we take into account net allocation to special funds, which is measured as follows:

$$SF_R = \frac{ASF_R - WSF_R}{P}$$

where *ASF* and *WSF* respectively refer to the total amount allocated to special funds (= operating expenses) and withdrawn from special funds (= operating revenues) and $_R$ refers to reported figures. Then, P is the cantonal population. The variable may therefore be either positive (SF > 0) when *ASF* > *WSF* or negative (SF < 0) when *ASF* < *WSF*. We consider the difference between *ASF* and *WSF* (and not the contrary) since we are interested in knowing when a government bails out its special funds, what occurs when allocations are bigger than withdrawals.

Table 4 reports the usual summary statistics regarding the net allocation to special funds per capita (SF). It follows the same structure as Table 3 with the column "Occurrence" revealing the number of years during which the gross allocation was larger than the withdrawal.

Every canton without exception has used special funds during the considered period. Again, a strong heterogeneity appears both between cantons and between years. Whereas the canton of Glarus (GL) allocated a net amount of +188.43 CHF per capita between 1980 and 2012, the canton of Zug (ZG) withdrew a net amount of -98.91 CHF per capita. Thus ZG is among the 5 cantons that withdrew more money than they allocated to special funds. However on average, the 26 Swiss cantons allocated more than they withdrew (30.04 CHF). The minima also show that every canton withdrew from its special funds at some point. The maxima values indicate that all the cantons booked some positive allocations. This is confirmed by the occurrence of positive net allocation which varies between 93% of the years in the canton of Valais (VS: 28/30) and 6% of the year in the canton of Jura (JU: 2/33). Therefore the intercantonal and the intertemporal variability is strong. Anew, in order to highlight the strong intertemporal heterogeneity in the use of special funds, we report in Table 23 presented in Appendix C the average annual amount of the net allocation to special funds for the considered period.

Table 4: Net allocation to special funds in real terms per capita (1980 - 2012)

Canton	N	Mean	Std. dev.	Min	Max	Occurrence
GL	33	188.43	732.95	-294.34	3'728.94	10
BL	32	126.45	248.29	-152.91	1'212.20	28
BS	18	83.92	313.40	-959.85	503.20	15
FR	17	79.57	147.36	-84.49	453.67	12
VS	30	66.70	157.65	-564.28	431.34	28
OW	27	58.48	226.86	-256.91	973.21	14
GR	25	57.06	304.82	-217.16	1'352.59	11
AR	33	54.36	181.51	-135.65	920.17	20
SH	23	42.35	45.96	-52.32	130.86	18
TG	31	36.48	262.04	-64.19	1'439.55	11
GE	27	31.32	32.17	-1.91	127.10	21
NE	33	27.51	100.37	-200.87	369.51	20
TI	33	26.12	17.58	-24.02	62.84	29
AI	33	22.58	134.67	-163.88	528.14	21
VD	33	21.52	102.65	-268.48	251.66	27
SG	16	17.93	434.55	-460.86	1'468.72	6
ZH	31	15.28	98.66	-120.09	326.88	14
NW	33	13.38	58.23	-41.62	324.90	22
BE	26	11.04	85.69	-236.66	214.83	16
UR	29	2.90	186.05	-286.42	565.10	10
SZ	26	2.78	33.69	-76.27	86.75	10
LU	25	-0.99	23.48	-63.40	28.90	17
SO	31	-10.77	74.64	-190.63	119.74	19
AG	18	-20.01	830.43	-2'382.66	1'645.80	15
JU	33	-74.44	106.19	-631.91	68.09	2
ZG	33	-98.91	298.85	-568.39	680.23	14
Mean		30.04	201.49	-326.93	692.88	17

Source: Swiss cantons' statement of financial performance and own calculations

6.3 Reported and corrected balances of the statement of financial performance

In the current subsection, we first present the reported balance of the statement of financial performance, which is the balance reported in public accounts and publicly available . Then, after having depicted the reported balance, we propose an operationalization of the corrected balance, i.e. the corrected balance cleaned of creative accounting operations. Finally, the rest of the subsection is devoted to statistical analysis in which we confront the reported and the corrected balance to various perspectives.

Operationalization of the reported SPER-balance

Using computed financial data provided by Swiss cantons, we can express the reported SPER-balance as follows:

$$Balance_R = \frac{Revenue_R - Expense_R}{P}$$

where $Revenue_R$ and $Expense_R$ respectively refer to the reported operating revenues and reported operating expenses and where P is the cantons' population. The indice $_R$ indicates we are talking about reported figures. Then, by definition, $Balance_R$ may either be a surplus ($Balance_R > 0$) when reported operating revenues are bigger than reported operating expenses ($Revenue_R > Expense_R$) or a deficit ($Balance_R < 0$) when reported operating revenues are lower than reported operating expenses ($Revenue_R < Expense_R$).

Operationalization of the corrected SPER-balance

Nevertheless, as suggested in the two previous subsections, reported SPER-balances are on average downward biased ($Balance_R \to 0$) since they suffer the presence of creative accounting operations (i.e. additional depreciation charges and operations on special funds) which increase operating expenses. Reported SPER-balances do not therefore highlight a true and fair view of the cantons' financial situation. Consequently, to represent a truer and fairer view of the cantons' financial situation, reported SPER-balances need to be corrected.

By correcting reported SPER-balances, we aim at establishing what they would have been if creative accounting had not been used during the considered period.[49] That way, the corrected balance of the statement of financial performance ($Balance_C$), namely the reported balance of the statement of financial performance cleaned of creative accounting operations can be expressed as follows:

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[49]We would like to point out that the corrected SPER-balances we calculate are approximations and may not exactly correspond to reality. For the purpose of this research, we only concentrate on two particular accruals, i.e. the additional depreciation charges and allocations (withdrawals) to (from) special funds. It is indeed commonly known that cantons may have more than one trick up their sleeve. For instance, the literature provides strong evidence that cantons can toy with the nature of public spending, or artificially increase as well as decrease provisions in order to smooth fiscal balances. One must also bear in mind that some cantons prefer manipulating ordinary depreciation charges instead of using additional depreciation charges. Finally, since the main objective of creative accounting is to not be detected, it is very likely that cantons still resort to other gimmicks.

$$Balance_C = Revenue_C - Expense_C$$

$$Balance_C = (Revenue_R - WSF_R) - (Expense_R - ADC_R - ASF_R)$$

$$Balance_C = Balance_R + ADC_R + ASF_R - WSF_R$$

$$Balance_C = Balance_R + ADC_R + SF_R$$

where $Balance_C$ is therefore the difference between the corrected revenues ($Revenue_C$) and the corrected expenses ($Expense_C$), i.e. the reported operating revenues and expenses cleaned of additional depreciation charges and operations on special funds.[50] In other words, the corrected SPER-balance is the sum of the reported SPER-balance ($Balance_R$), of the total amount of additional depreciation charges (ADC_R) and of the net allocation to special funds (SF_R).

Quantitative importance of the reported and corrected SPER-balances

Figure 9 below simultaneously displays the SPER-balance as it was reported by cantons, i.e. the balance marred by creative accounting ($Balance_R$) and the corrected balance ($Balance_C$).[51] Of course the corrected balance ($Balance_C$) reflects a truer and fairer view of the financial performance. Consequently, cantons having effectively resorted to creative accounting during the considered period have corrected balances that tend to be larger than the reported ones ($Balance_C > Balance_R$). Furthermore, Figure 9 provides the average reported and corrected balances of the 26 Swiss cantons over the considered period. In this figure, Swiss cantons are ranked according to their corrected balance, from the lowest to the largest.

First of all, Figure 9 below reveals a strong cantonal heterogeneity in terms of reported and corrected financial performance. Nonetheless, the average standard deviation appears to be smaller for reported balances, suggesting that creative accounting is effectively used to

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[50]Data relative to the variables $Revenue_C$ and $Expense_C$ are respectively presented in Table 24 and Table 25 in the Appendix.

[51]Numbers used to display the Figure below are presented in Table 26 in Appendix F. Moreover, reported and corrected balances are also presented under an annual basis in Table 27 in Appendix G.

smooth reported figures. For all cantons, except for Aargau (AG) and the Jura (JU), the mean of the reported balance is lower than the mean of the corrected balance. On average creative accounting operations lower the surplus from +219.46 CHF per capita down to a reported amount of +87.07 CHF per capita. Consistent with our hypothesis, this points out the fact that Swiss cantons generally experienced a structural surplus over the period which was partially hidden by creative accounting operations. This is at least true for cantons presenting a positive corrected balance ($Balance_C > 0$) between 1980 and 2012.

Figure 9: Reported and corrected SPER-balances in real terms per capita (1980 - 2012)
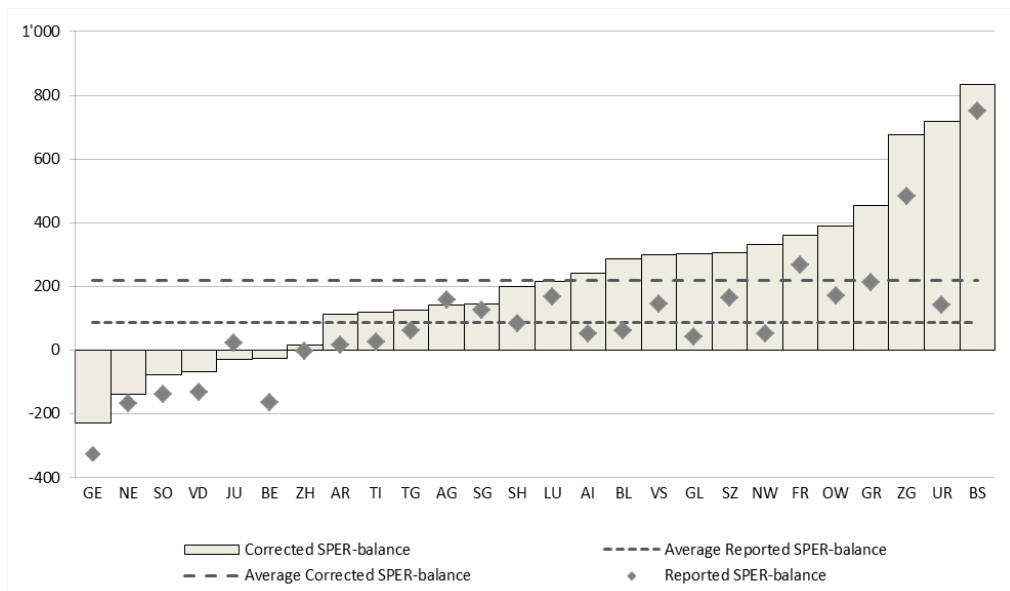
Source: Swiss cantons' statement of financial performance and own calculations

The picture is however slightly different when paying attention to cantons, except for the Jura (JU), presenting a negative corrected balance ($Balance_C < 0$) over the considered period. Indeed, for those cantons, the reported financial situation was worse than it was in reality ($Balance_R < Balance_C$). In other words, since reported deficits were on average larger than a true and fair representation, those cantons can reasonably be suspected of having resorted to big bath accounting. Conversely, the canton of the Jura (JU) appears to have hardly engaged in creative accounting in order to hide deficits since its corrected balance is negative whereas its reported one is positive.

In light of the graphical analysis presented above, the use of creative accounting seems

to differ between cantons according to the financial situation they have to cope with. For that reason, we provide an analysis of creative accounting below depending on whether governments are in situations of surplus ($Balance_C > 0$) or in deficit ($Balance_C < 0$).

Quantitative importance of the reported and corrected SPER-surplus

As mentioned above, in general, the reported balances ($Balance_R$) moved towards the equilibrium thanks to a surplus reduction. Figure 10 below provides clearer evidence since it only concentrates on times during which governments used creative accounting to cope with surpluses.[52] Concretely, Figure 10 shows for each canton its reported and corrected surplus as well as the average reported and corrected surpluses of the 26 Swiss cantons over the considered period. In this figure, Swiss cantons are ranked according to their corrected surplus, from the lowest to the largest.

Figure 10: Reported and Corrected SPER-surpluses in real terms per capita (1980 - 2012)
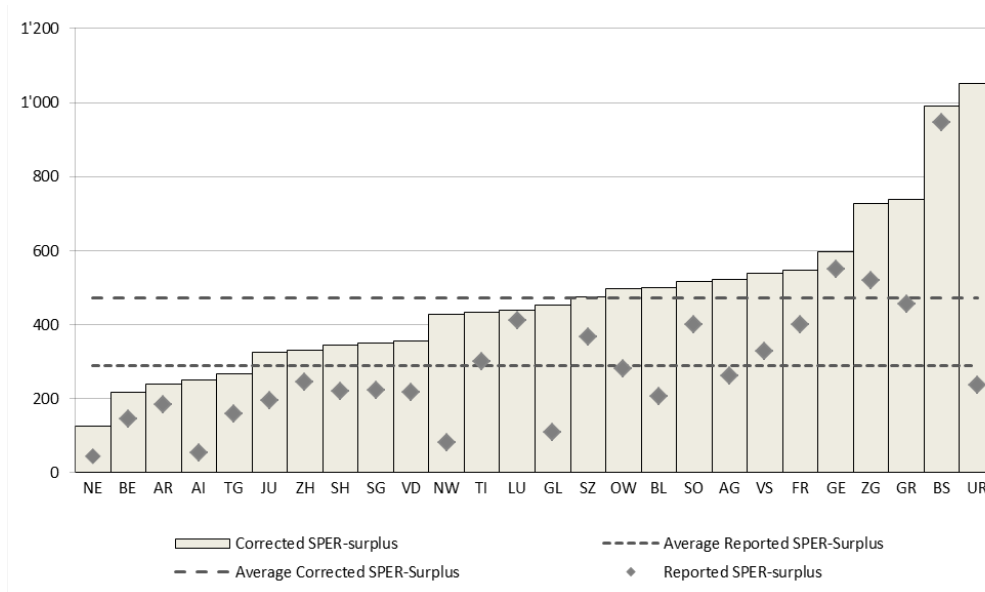
Source: Swiss cantons' statement of financial performance and own calculations

In spite of a strong cantonal heterogeneity in terms of corrected surplus, Figure 10 above highlights that, without any exception, Swiss cantons used to downward disguise reported surpluses. Indeed, whereas a true and fair representation should have highlighted an average

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[52]Numbers used to display the Figure 10 above are presented in Table 28 in Appendix H.

surplus of +471.02 CHF per capita, reported figures have only revealed an average surplus of +289.34 CHF per capita.

To do so, 23 out of the 26 Swiss cantons took the opportunity to report additional depreciation charges when operating revenues exceeded operating expenses. On average, about 126.90 CHF per capita have been accounted over the considered period. Identically, Swiss cantons enjoyed the occurrences of surpluses to bail out cookie-jar reserves for an average amount of 70.39 CHF per capita. However, contrarily to other cantons, the Jura (JU) and Zug (ZG) also artificially boosted reported surpluses by significantly withdrawing money for cookie-jar reserves during healthy financial periods. As evidence for this, both cantons reported an average excess of withdrawals over allocations to special funds by about 45.01 CHF per capita and 80.24 CHF per capita respectively in cases of corrected SPER-surpluses.[53]

Quantitative importance of the reported and corrected SPER-deficit

However, whilst governments having to deal with surpluses adopted the same strategy, their respective behavior was quite different when they had to cope with public deficits. Figure 11 below shows these differences by displaying their respective reported and corrected SPER-deficit for each canton.[54] Moreover, the average reported and corrected SPER-deficits are also presented for the whole sample and over the investigated period. Then, cantons are classified according to their corrected SPER-deficit, from the largest deficit to the smallest.

In light of Figure 11, evidence shown that goverments having faced public deficits also engaged in creative accounting in order to embellish the reality. Whereas the true and fair average deficit (i.e. average corrected SPER-deficit) was about -284.30 CHF per capita, governments reported an average deficit sensitively lowered (-259.11 CHF per capita). Among the 26 Swiss cantons, 14 of them performed such a strategy aiming at hiding deficits. To do so, Swiss cantons extensively withdrew money from special funds. On average, the net allocation to special funds exhibits a negative balance of about -78.80 CHF per capita.[55] Consistent with our assumption, special funds seem to have been used in Swiss cantons as

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[53]Numbers are presented in Table 30 in Appendix J.
[54]Numbers used to display the Figure 11 are presented in Table 29 in Appendix I.
[55]Numbers are presented in Table 30 in Appendix J.

cookie-jar reserves with the ultimate objective to smooth reported figures over time.

Figure 11: Reported and Corrected SPER-deficits in real terms per capita (1980 - 2012)
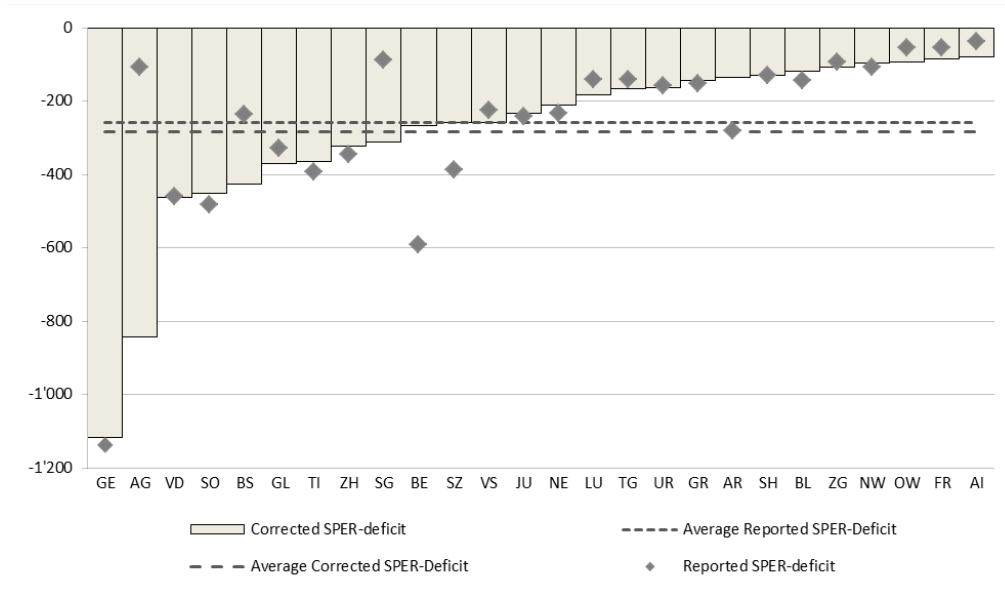
Source: Swiss cantons' statement of financial performance and own calculations

But at the other side of the spectrum, 12 out of the 26 cantonal governments appear to have given the bath to reported figures in cases of deficits. Indeed, for those cantons, their respective reported deficit was bigger than the real deficit (i.e. the corrected SPER-deficit). Indeed, some cantons did not hesitate to perform additional depreciation charges even in times of deficits, revealing obvious cases of big bath accounting. That way, when public balances were in deficit, reported figures worsened in 15 cantons by about 40.45 CHF per capita only through the resort to additional depreciation charges. In similar circumstances, some cantonal governments also worsened reported deficits by bailing out cookie-jar reserves. Indeed, although special funds have been used to lower reported deficit on average, an excess of withdrawals over allocations to special funds occurred in 7 cantons during times of deficits.

Overall picture of the governments' financial performance

In this subsection, we offer the overall picture of the reported and corrected governments' financial performance over the considered period. Indeed, Figure 12 below plots every corrected balance ($Balance_C$) on the horizontal axis against its corresponding reported balance

($Balance_R$), on the vertical axis. Thus, 729 observations are represented in this figure. Then, the diagonal line separating the figure in two distinct parts refers to cases during which the reported balance presents the true and fair governments' financial performance ($Balance_R = Balance_C$). Finally, figure 12 is split up in six areas revealing the six conceivable evolutions of the true and fair balance ($Balance_C$) towards the reported one ($Balance_R$).

Figure 12: Reported and corrected SPER-balance in real per capita (1980-2012)
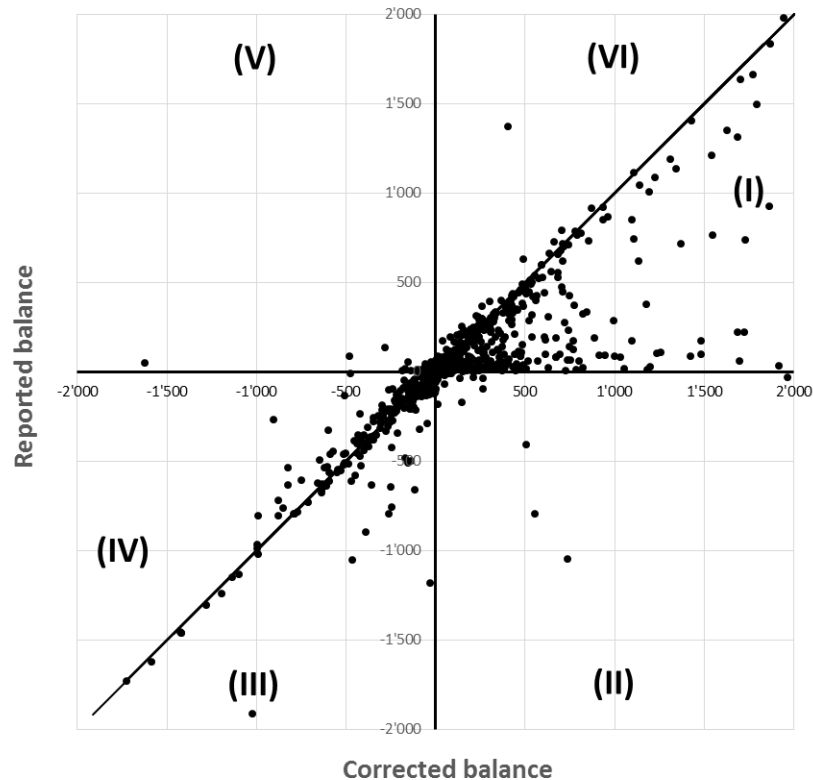
Source: Swiss cantons' statement of financial performance and own calculations

When looking at area I (n = 359), which includes cases of surpluses ($Balance_C > 0$), a significant proportion of the observations are situated below the black diagonal line, meaning that $Balance_R < Balance_C$.[56] Moreover, as revealed in area II (n = 28), surpluses ($Balance_C > 0$) have sometimes been so hardly cooked that deficits ($Balance_R < 0$) were finally reported.

[56]Logically enough, the figure brings out that cantons with comparatively small surpluses (e.g. $500 > Balance_C > 0$) seem to embark regularly and proportionally in substantial creative accounting operations. Considering a canton that accumulates large surpluses over the years, it will have some freedom to reduce taxes or to increase operating expenses without deteriorating its future financial situation. On the other hand, a canton with a weak financial situation will have less leeway. Consequently, if the surpluses are smaller and less frequent, the canton will be more likely to hide surpluses and to bail out special funds in order to ensure a structural surplus over time.

Then, at the other side of the spectrum, some governments also managed to report larger surpluses ($Balance_R > 0$) than truthful ($Balance_C > 0$) as depicted in area VI (n = 68).

Regarding management of deficits ($Balance_C < 0$), obvious evidence of big bath accounting is provided in area III (n = 127) since reported deficits ($Balance_R < 0$) appear to be worse than in the reality ($Balance_C < 0$). Even if such a strategy seems to have been used for relatively small amounts in general, sometimes deficits have also been largely worsened. By resorting to such a practices, Swiss cantons may reasonably be suspected of having wanted to reduce operating expenses in the future and finally achieving better financial results over time. Conversely, deficits ($Balance_C < 0$) have also been downwardly manipulated. Indeed, as presented in area IV (n = 97), governments managed to embellish the reality by mainly withdrawing money from special funds. Finally, even if it accounts for extreme cases, some governments also sometimes manipulated deficits ($Balance_C < 0$) until reporting surpluses ($Balance_R > 0$) as shown in area V (n = 33).

6.4 Finance ministers' personal characteristics and creative accounting

As discussed in section 3, we argue that cantonal finance ministers are mostly responsible for the resort to creative accounting during the reporting process. More particularly, we consider that their personal characteristics strongly affect their behavior regarding the use of accounting gimmicks.

That is why, in order to test whether finance ministers matter in the use of creative accounting operations, we collected data regarding their personal characteristics from 1980 to 2012.

Finance ministers' political ideology

Among all the characteristics we take into account in this research, we expect the finance ministers' political ideology to be one of the main drivers for the use of creative accounting operations. Therefore, Table 5 below presents the different political parties having taken position at the head of a cantonal ministry of finance between 1980 and 2012. For each

political party a measure of its ideological position is attached, and is ranged on a scale going to 0 (far left-wing party) to 10 (far right-wing party).[57] Finally, the line "Ministers" reports the number of finance ministers attached to each political party during the considered period.

Table 5: Finance ministers' political parties and their respective political ideology

Party	SP	GPS	CSP	Misc.	LDP	CVP	FDP	BDP	PLS	SVP
Ideology	2.6	3.2	5	5	5.2	5.4	6.8	7.6	7.6	7.7
Ministers	11	1	2	4	1	41	36	2	4	14

Source: Ladner (2006) and own calculations

Considering independent parties ("Misc.") as the middle of the political spectrum, Table 5 reveals that there are more right-wing political parties than left-wing ones in Swiss cantons that have occupied the position of finance minister. Indeed, whereas 6 right-wing parties were at the head of a ministry of finance between 1980 and 2012, only 3 left-wing parties were represented during the same period. Moreover, in terms of finance ministers, most of them are affiliated to right-wing parties, with the CVP and the FDP accounting for 77 out of the 116. Finally, political parties situated at both extremes of the political scale almost occupy a comparable number of seats during the considered period.

Table 6 below displays the average amount of additional depreciation charges and special funds recorded by each political party during the period 1980 - 2012. For each political party, the Table shows the average amount of additional depreciation charges and special funds, the standard deviation, the minimum and maximum values.

When paying attention to the data relative to additional depreciation charges, one must first highlight the strong heterogeneity between the different political ideologies. This is strongly revealed by the average standard deviation at the bottom of the table. Whereas GPS and LDP are associated with no additional depreciation charges, independent finance ministers (Misc.) are those who resort to this practice the most.

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[57]From the left to the right, finance ministers were affiliated to the follwing parties during the considered period: the Social Democratic Party of Switzerland (SP), the Green Party of Switzerland (GPS), the Christian Social Party (CSP), No Political Party (Misc.), the Liberal-Democratic Party of Basel Stadt (LDP), the Christian Democratic People's Party (CVP), the Liberals (FDP), the Burgher-Democratic Party (BDP), the Liberal Party of Switzerland (PLS), the Swiss People's Party (SVP).

Table 6: Additional depreciation charges and special funds in real terms per capita by ideology

| | Additional depreciation charges (ADC) | | | | Net allocation to special funds (SF) | | | | |
Ideology	Mean	Sdt. Dev.	Min	Max	Mean	Sdt. Dev.	Min	Max	N
SP	35.24	107.29	0.00	574.86	64.20	142.99	-268.48	503.20	55
GPS	0.00	0.00	0.00	0.00	5.41	15.16	-1.91	39.76	7
CSP	112.97	157.13	0.00	408.48	67.54	193.41	-564.28	366.46	16
Misc.	316.68	642.46	0.00	2827.58	-38.09	63.70	-163.88	67.56	19
LDP	0.00	0.00	0.00	0.00	-70.80	301.05	-959.85	83.3	11
CVP	103.70	200.04	0.00	1563.19	31.18	367.85	-2382.66	3728.94	266
FDP	127.67	253.81	0.00	1261.12	20.93	188.70	-568.39	1352.59	239
BDP	89.57	77.65	0.00	138.04	-146.84	77.79	-236.66	-100.66	3
PLS	93.09	405.77	0.00	1768.71	41.01	84.20	-34.92	369.51	19
SVP	94.76	302.99	0.00	2444.80	48.17	213.84	-285.41	1439.55	94
Mean	97.37	214.71	0.00	1098.68	2.27	164.87	-546.64	785.02	729

Source: Swiss cantons' statement of financial performance and own calculations

When focusing more in detail on the data, it is brought to our attention that right-wing finance ministers are those who have the largest average amount of additional depreciation charges. Indeed, if we do not take into account independent finance ministers (Misc.), left-wing and right-wing finance ministers respectively resorted to 49.40 CHF per capita on average and to 84.79 CHF per capita. Nevertheless, Markus Stadler (canton of Uri) who was affiliated to independent finance ministers during the considered period is now part of the Green Party of Switzerland (GPS). We cannot therefore rule out that he partly embraced a more left-wing practice of additional depreciation charges during his mandate. If that were to be true, it would strongly change the picture. Indeed, left-wing finance ministers would be associated with an average amount of additional depreciation charges of about 161.90 CHF per capita. As a consequence, it would tend to validate our hypothesis stating that finance ministers situated on left of the political spectrum would have stronger incentives to use accounting gimmicks than right-wing ones.

Then, when focusing on the use of special funds, quite similar conclusions may be drawn. Again, the average amounts of special funds exhibit large differences depending on the ideology of the finance ministers. This is confirmed when looking at the average standard deviation at the bottom of the table. Moreover, data relative to special funds also tends to support our hypothesis as to the relationship between the finance ministers' political ideology and the use of creative accounting operations. Indeed, while the average amount of net allocation to

special funds is positive for left-wing parties (45.71 CHF per capita), it is negative for right wing ones (-12.72 CHF per capita). In other words, amounts allocated to special funds are larger than those withdrawn when more conservative finance ministers are in position. This therefore tends to support the idea that left-wing finance ministers constitute larger reserves than right-wing ones.

Finance ministers' experience

Then, we expect that the finance ministers' experience, measured by the time in position, may strongly affect the use of creative accounting operations. Table 7 below reports the average amounts of additional depreciation charges and special funds according to the finance ministers' experience. The column "Experience (E)" refers to the finance ministers' tenure, which is expressed in months. Nine periods of 24 months are displayed. For each time period, the table shows the average amount of additional depreciation charges and special funds, the standard deviation as well as the minimum and maximum values. The column "Ministers" accounts for the number of finance ministers associated to each category.

Table 7: Additional depreciation charges and special funds in real terms per capita regarding the finance ministers' experience

		Additional depreciation charges (ADC)				Net allocation to special funds (SF)				
Experience (E)	Ministers	Mean	Sdt. Dev.	Min	Max	Mean	Sdt. Dev.	Min	Max	N
0 < E < 24	8	89.75	136.88	374.89	0.00	14.84	86.45	132.54	-121.41	11
24 < E < 48	13	195.89	200.47	589.57	0.00	46.74	217.49	442.29	-393.85	41
48 < E < 72	15	43.50	60.32	170.75	0.00	24.39	115.43	236.33	-315.12	74
72 < E < 96	26	109.38	155.07	675.02	0.00	58.57	214.81	933.31	-358.50	161
96 < E < 120	9	65.71	82.06	234.43	0.00	37.30	65.90	167.46	-45.73	83
120 < E < 144	17	76.71	159.05	633.05	0.00	20.94	67.94	151.01	-115.05	133
144 < E < 168	11	36.88	60.04	194.80	0.00	23.56	73.01	223.03	-70.81	71
168 < E < 192	14	121.21	245.42	916.50	0.00	29.57	59.63	145.01	-58.12	106
E < 192	3	80.89	56.37	129.72	19.20	-14.05	14.15	-3.37	-30.10	49
Mean	116	91.10	128.41	435.42	2.13	26.87	101.65	269.74	-167.63	729

Source: Swiss cantons' statement of financial performance and own calculations

First of all, we notice that the use of additional depreciation charges strongly differs according to political experience. For instance, whereas politicians having served as finance ministers between 24 and 48 months show an average amount of additional depreciation

charges of 195.89 CHF per capita, the most experienced finance ministers report an average amount that is about two or three times smaller (80.89 CHF per capita). Moreover, with the exception of finance ministers having an experience ranging from 168 to 192 months, results highlight that the average amount of additional depreciation charges decreases with political experience.[58] In other words, conversely to the hypothesis formulated in Section 3, more experienced finance ministers appear to be associated to lower amounts of additional depreciation.

Then, quite similar findings ensue from the analysis of special funds. A first observation is that the use of special funds strongly differs according to the finance ministers' experience. This may be observed by looking at the standard deviation at the bottom of the table. Then, looking at the relationship between the finance ministers time in office and their respective use of special funds, there is no clear evidence that more experienced finance ministers are associated with lower reserves accumulated through special funds. Nevertheless, when considering the first four and last four categories as two distinct groups, evidence is given that finance ministers having a longer tenure accumulate lower reserves. Respectively, while more experienced finance ministers are associated to an average amount of special funds of 15.01 CHF per capita, less experienced finance ministers report an average amount of 36.14 CHF per capita. That way, as for additional depreciation charges, results tend to contradict our hypothesis since it appears that more experienced finance ministers account for lower reserves than inexperienced ones.

Finance ministers' educational background

Finally, as discussed in the section devoted to the hypothesis, we also expect that the finance ministers' educational background may influence their behavior concerning the use of creative accounting. In order to provide a first insight to this relationship, Table 8 reports the descriptive statistics about the finance ministers' educational background. While

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[58]One must keep in mind that the category reffering to finance ministers having an experience ranging from 168 to 192 months is a particular case. Indeed, this category includes Carlo Dittli (Canton of Uri) whose the associated amount of additional depreciation charges is 916.50 CHF per capita. However, if we exclude this *outlier*, the average amount of additional depreciation charges for the considered category falls to 60.03 CHF per capita. This reinforces previous observations even more suggesting that more experienced finance ministers resort to creative accounting to a lesser extent.

the first column ("Education") indicates the different types of education attended by finance ministers, the second one ("Ministers") reveals the number of finance ministers associated to each educational background. Then, for each training, the table shows the average amount of additional depreciation charges and special funds, the standard deviation, as well as the minimum and maximum values.

Table 8: Additional depreciation charges and special funds in real terms per capita regarding the educational background

		Additional depreciation charges (ADC)				Net allocation to special funds (SF)				
Education	Ministers	Mean	Sdt. Dev.	Min	Max	Mean	Sdt. Dev.	Min	Max	N
Apprenticeship	30	93.22	164.21	0.00	1'175.75	13.06	153.28	-475.32	920.17	215
Politics	6	96.37	102.97	0.00	262.87	-34.14	79.55	-217.16	52.70	16
Economics	28	250.12	439.93	0.00	2'827.58	89.97	382.25	-294.34	3'728.94	133
Law	38	64.86	193.84	0.00	2'444.80	6.91	282.54	-2'382.66	1'645.80	288
Other	15	67.20	140.98	0.00	718.41	42.27	209.09	-256.91	1'439.55	89
Mean	117	114.35	208.38	0.00	1'485.88	23.62	221.34	-725.28	1'557.43	741

Source: Swiss cantons' statement of financial performance and own calculations

As highlighted in the column "Ministers", finance ministers who have a university degree in economics are not the majority. Indeed, most of them have a degree in law. Moreover, surprisingly enough, a large part of the finance ministers do not even have a university education and underwent an apprenticeship instead. Afterwards, regarding the relationship between the use of creative accounting operations according to the different educational backgrounds, data reveals a strong heterogeneity for both additional depreciation charges and special funds. Nevertheless, data tends to support our hypothesis. Indeed, finance ministers who have a degree in economics are those who resort to creative accounting the most. Respectively, they are associated to an average amount of additional depreciation charges and special funds of about 250.12 CHF per capita and 89.97 CHF per capita respectively.[59]

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[59]Nevertheless, among finance ministers having a degree in economics, there is Carlo Dittli from the canton of Uri who is associated to relatively high amounts of additional depreciation charges compared to his counterparts.

7 Qualitative analysis of creative accounting in Swiss cantons

In order to reinforce our theoretical framework and to validate the hypothesis formulated in section 3, we performed one complementary qualitative analysis.[60] The analysis is based on nine interviews carried out with experts in the field of Swiss public finance and a questionnaire sent to the 26 cantonal administrations of finance.

The content of the current section is structured as follows. After having detailed the methodology in the first subsection, we then report results ensuing from interviews and questionnaires. Concretely, in distinct subsections, we present experts' points of view regarding the use of additional depreciation charges and special funds in Swiss cantons. We then deal with the impact of these accruals on the governments' financial performance and tackle the role played by finance ministers in the use of both accruals. Finally, the last subsection is devoted to a summary and a discussion of the results.

7.1 Methodology

Concerning the interviews analysis, the first step consisted in developing the plan of interviews. This includes a series of open questions devoted to the use of additional depreciation charges and special funds in Swiss cantons.[61] The objective is to get information about what additional depreciation charges and special funds are and why they are used in Swiss cantons. At the same time, we were interested in knowing whether finance ministers play a key role in the use of such practices and mainly whether such practices have an impact on the govermnents' financial situation. For the questionnaires sent to the 26 cantonal administrations of finance, we almost used the same plan. The main differences relied on the fact that we profit from the opportunity to ask more detailed questions to cantonal administrations of finance about particular numbers reported in public accounts.[62]

Simultaneously to designing the plan of interviews, we defined our sample of experts. Following a convenient sampling approach, the selection of the experts mostly relied on our

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[60]The current qualitative analysis also gives food for thought regarding the interpretation of the results we obtain in the next two sections.

[61]The plan of interviews we used to conduct the interview process is presented in Appendix O.

[62]We provide an example of the questionnaire we sent to cantonal administrations of finance in the Appendix O.

network and on people's availability. On the 10 people we solicited, 9 answered favorably. Among these 9 experts, 3 of them are professors of public finance in a Swiss university; 3 others are current or former directors of a finance cantonal inspection and the last 3 experts are former members of a cantonal administration of finance. For the needs of the research, we call them "Scholar", "Auditor" and "Practitioner" respectively. Then, among the 26 questionnaires we sent, 2 cantonal administrations did not reply. At this stage, some considerations must be kept in mind regarding both samples of population we resorted to to conduct this qualitative analysis. Whereas interviewed experts are external experts of cantonal administrations, questionnaires were filled in by civil servants, i.e. internal members of cantonal administrations.

Then, interviews took the form of semi-structured interviews and all of them were recorded and then transcribed. Finally, the analysis of data consisted in gathering information into main items; these items being the base of our analysis. As proposed by Braun and Clarke (2006), by gathering and comparing the experts' points of view regarding each item, we obtained a broad and accurate understanding of our subject of interest. The same approach was used to analyze questionnaires.

7.2 Use of additional depreciation charges in Swiss cantons

Interviews analysis

When starting to talk about additional depreciation charges, most experts highlighted the importance of well defining the notion. As underlined by Practitioner III, it first implies being aware about the ordinary depreciation charges. Naturally, both aspects are tightly tied together as the methodology used for the ordinary depreciation charges will determine the additional ones. Indeed, whether a canton uses the digressive or the straight-line depreciation methodology will strongly influence the amounts recorded as ordinary depreciation charges and therefore as additional depreciation charges. The same relationship appears when we play with depreciation rates.[63]

In the nature of the HAM1, ordinary depreciation charges do not aim at reflecting the

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[63]This is strongly in line with what we exposed in section 4 devoted to the main accounting elements.

impairment loss of an asset. Through the depreciation charges, it is expected that communities have to feel the weight of their investments. That way, as mentioned by Scholar III, *"by depreciating on shorter time periods, communities should bear the cost of their investments"*. Therefore, it may be argued that ordinary depreciation charges may be considered as a tool of budgetary policy. As a proof, Auditor III revealed that his canton has sometimes not hesitated to play with the depreciation rates according to the financial situation. Moreover, 3 out of the 9 discussants declared that depreciation rates strongly differ between the Latin and the German parts of Switzerland; the depreciation rates being higher in the eastern part of Switzerland. Interestingly enough, the Latin cantons generally face higher deficits. Therefore, one must notice that depreciation rates would not necessarily reflect the lifespan of an asset since some considerations with regard to the fiscal policy seem to prevail when considering the depreciation policy.[64]

After having discussed the ordinary depreciation policy, most of the people interviewed went on to talk about additional depreciation charges. While they were speaking, they first started by giving a definition or, at least, by explaining the reasons why such practices are used in Swiss cantons.

When defining additional depreciation charges, Auditor II, Practitioner III and Scholar I, first asserted that these operations would aim at adjusting the balance of the statement of financial performance. In particular, according to 5 out of the experts, such a practice would be embraced in Swiss cantons in order to hide surpluses. More precisely, 4 out of them sustain that the objective behind the concealment of financial results is to avoid tax rates decreases and/or spending increases. This would provide flexibility to governments in order to cope with the business cycle. This point is supported by Practitioner II and Scholar III who declare that this flexibility allows governments to smooth public deficits over time. Practitioner I then explains that Swiss cantons use additional depreciation charges because they are reluctant to borrow to finance their investments.

In light of the foregoing, it is obviously the financial situation that guides the use of

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[64]At the same time, such practices go against the "user pays" principle though supported by the HAM1. Indeed, as defended by three experts, this raises intergenerational problems. To sum up and highlight the problems surrounding such high depreciation rates, as well as additional depreciation charges, Scholar I claims that *"these depreciation charges represent a gift for future generations since they will not have to pay for the assets they consume"*.

additional depreciation charges. However, there is no general rule, as sustained by Scholar I and Practitioner II. Quite the contrary according to Scholar II. Based on his own experience, there are probably 26 different strategies since the use of additional depreciation charges is totally discretionary. Moreover, Practitioner I, Practitioner III and Scholar I assert that such practices mostly depend on the finance ministers. And at the same time, Auditor III and Scholar III do not exclude the possibility that those accounting practices rely on cultural backgrounds, without actually providing more details.

When discussing additional depreciation charges, we confronted our definition of creative accounting formulated in Subsection 5.3 with the experts' point of view. In other words, we investigated whether experts shared our opinion, meaning that additional depreciation charges are creative accounting since we argue they have no economic reality and are consequently used in the sole purpose of modifying the reported figures.

Table 9 below reports the extent to which experts express the opinion that additional depreciation charges have no economic reality and have to be assimilated to creative accounting. While columns indicate whether additional depreciation charges are perceived by experts as having no economic reality, lines report whether additional depreciation charges account for creative accounting operations according to these experts.

Table 9: Experts' perception regarding the use of additional depreciation charges

	Economic reality	+/- Economic reality	No economic reality	No opinion
Not creative accounting			A-II ; P-I	
Creative accounting	P-III	A-III ; S-III		S-I ; S-II
No opinion			A-I	P-II

When looking at Table 9 and especially at elements presented in the second line, 5 out of 9 experts consider additional depreciation charges as creative accounting although they do not strictly call into question the economic reality. In other words, these experts assimilate additional depreciation charges to creative accounting even if they argue that these accruals may have an economic reality. According to Practitioner III, finance ministers could strategically chose the year in which to perform fair assets write-downs through additional depreciation charges. According to him, *"some [real] corrections could have been made during*

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good financial years. In that case, it would be a good means to combine cosmetic and eco-nomic reality". In such circumstances, although additional depreciation charges refer to *"real corrections"*, they are considered as creative accounting since they are strategically used to disguise the governments' financial performance. Nevertheless, 2 out of 9 people interviewed (Auditor III and Scholar III) support the idea that additional depreciation charges may have an economic reality or may not. As for Scholar I and Scholar II, who express no opinion regarding the economic reality of additional depreciation charges, they clearly argue that additional depreciation charges are creative accounting operations. Alternatively, Auditor II and Practitioner I offer another vision when they stipulate that additional depreciation charges are not creative accounting as their use is not banned by cantonal financial laws. According to them, it is the legality of accounting operations that determines whether accruals correspond to creative accounting. Consistently with Auditor II and Practitioner I, Auditor I calls into question the economic reality of additional depreciation charges. However, he could not confirm that it constitutes creative accounting as it is legal. Finally, Practitioner I and Practitioner II have no opinion regarding the economic reality of these accruals. Further-more, they do not confirm whether they condiser additional depreciation charges as creative accounting operations or not.

Questionnaires analysis

When dealing with the use of depreciation charges in Swiss cantons, civil servants who filled in the questionnaires first paid particular attention to presenting ordinary depreciation policy. Indeed, the use of additional depreciation charges is strongly tied to the ordinary depreciation charges. That way, one can hardly appreciate the latter without being fully aware of the former.

The first thing that appears is the relative homogeneity among Swiss cantons when we scrutinize their ordinary depreciation charges policy. Among the 24 cantonal administrations in which questionnaires were completed, 19 of them announce that the diminishing balance method is used in their canton. Conversely to the straight-line method, the diminishing bal-

ance method expenses assets at a constant rate resulting in declining depreciation charges every year which allows to have relative high amounts of depreciation charges during the first years. Then, 7 out of the 19 cantonal administrations of finance provided precise indications as to the depreciation rate applied in their respective canton. On average in those cantons, depreciation rates range from 8% to 25%. In the canton of Fribourg (FR), it is stated that public assets must be amortized in a maximum period of 20 years. When put in the perspective of the lifespan of public assets, those depreciation rates appear to be relatively high. It thus supports the idea that, at least in those cantons, the main objective of depreciation policy is not to reflect a true and fair view of public assets in the first place as required by the IPSAS norms. Besides, this opinion is reinforced by the cantonal administration of Uri (UR) when it informs that *"[t]he evolution of ordinary depreciation charges is the result of considerations motivated by financial policy reasons"*. Finally, in 5 Swiss cantons, the resort to the straight-line depreciation method is the rule. And in those cantons, depreciation rates also appear to be mainly driven by fiscal (and political) considerations. Indeed, among them only the cantons of Basel-Landschaft (BL) and Luzern (LU) consider the lifespan of public assets to determine depreciation rates, whereas in the three others (NE, SG and SH) the maximum duration to totally amortize an asset is 25 years.

Now, after having paid attention to ordinary depreciation charges, we focus on the additional ones. The first interesting thing to notice is that the practice of additional depreciation charges appears to be strongly anchored in Swiss cantons' culture. At the same time, our belief that the economic reality of such accruals is secondary, not to say nonexistent, is strongly confirmed. Indeed, it is admitted in 18 cantons that additional depreciation charges are used as a tool of budgetary policy. For instance, in the canton of Thurgau (TG), there is no criteria guiding the use of additional depreciation charges since *"one must act in regard to the financial situation"*. And this is without any doubt the case in a large part of the Swiss cantons as it is argued in some of them that additional depreciation charges were used in order to hide the money coming from the Swiss National Bank in 2005 for example. And the objective hidden behind such a practice seems to be clearly understood in cantons. In accordance with other Swiss cantons, it is said in the canton of Glaris (GL) that *"the ob-*

jective is to smooth results and to ease future figures through a reduction of the assets to be amortized". In light of this information, there is no doubt that additional depreciation charges are obviously used as a tool of budgetary policy. This appears to be in line with the reply obtained from the canton of Valais (VS) that suggests that *"additional depreciation charges and special funds are often seen as a manipulative behavior of the results".* There is thus every reasons to believe that special funds are at least partially used in the same way as additional depreciation charges.

7.3   Use of special funds in Swiss cantons

Interviews analysis

The second part of the interviews was then devoted to the use of special funds in Swiss cantons. Generally, most of the experts started by discussing the definition of this accrual. In this respect, Scholars II and III mention that this particular type of funds is more common at the municipal level rather than at the cantonal one. According to their knowledge and experience, both discussants argue that fees are not collected at the cantonal level. Instead, special funds would be mostly bailed out through general tax revenues.

Consequently, Scholar I sustains there is almost no real special funds at the cantonal level. This point is reinforced by Auditor II who thinks that *"each canton should adapt special funds depending on its financial situation".* It would seem that Swiss cantons *"bail out these funds when they have more tax revenues"*, as suggested by Scholar III. Therefore, everything suggests that operations on special funds are performed in order to influence the reported governments' financial situation. Moreover, as the link between the task to be fulfilled and the origin of the payment gives the impression it is partially broken, some discussants question the economic reality surrounding these funds. However, as defended by Auditor I, there might also be an economic reality behind special funds even if they are financed with general tax revenues. According to Auditor I, it is the objective of the special funds that determines its economic reality rather than its mode of financing.

However, in spite of the last consideration, some interviewed experts tend to denounce the lack of transparency regarding special funds at the cantonal level. Indeed, despite the

clear definition formulated in the HAM1 and most of the cantonal legislation, Practitioner III asserts that the use of special funds strongly differs among cantons. To resume his words, *"when looking at special funds, we are comparing apples and bananas"*. For that reason, as supported by 4 out of 9 experts, it is almost impossible to distinguish special funds, reserves and provisions in Swiss cantons even though these operations are strictly different from a pure accounting perspective.

The element exposed above would thus lead to the conclusion that special funds may be used as a tool of budgetary policy. Although it is theoretically conceivable that special funds may be used that way, Practitioner I and Practitioner II would not affirm it. However, even if Auditor II admits that special funds are used as a political tool in his canton, he warns that such practices must not be seen as creative accounting since they are legal. Moreover, 3 out of the interviewed people do not hide the fact that these funds are used strategically under particular circumstances. Scholar II remarks that *"most of time, these funds are bailed out discretionarily"*. For example, Scholar II mentions that in 2005 several cantons decided to put the money derived from the Swiss National Bank gold into these funds instead of leaving it in the net equity.[65] Then, even if he recommends not systematically considering special funds as creative accounting, Auditor I reveals that some facts give a clue. For instance, large fluctuations over time or budget overruns of the amounts allocated into special funds highlight the fact that special funds are used to conceal good news without any doubt. In that case, special funds *"are accounting manipulations that have no economic reality"*.

To conclude, for special funds, there is a strong opposition between the economic and the legal perspectives; both angles are not compatible when dealing with the creative accounting characteristics. Indeed, a number of experts point out legal aspects to justify accounting operations which sole objective is to modify the reported governments' financial situation.

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[65]2005 is a particular year to scrutinize in order to explain and understand the use of additional depreciation charges and special funds. Indeed, that year, Swiss cantons received 21 billion CHF from the Swiss National Bank subsequently to a public sale of gold reserves. Such a large amount of money represented exceptional revenues for Swiss cantons. That way, in order to hide those exceptional revenues, Swiss cantons recorded unusually high amounts of additional depreciation charges or allocation to special funds as demonstrated in Table 22 and Table 23 in Appendix B and C, respectively. This therefore highlights the discretionary characteristic of both accruals and allows to question their economic reality by far.

Questionnaires analysis

In the light of the comments provided by cantonal administrations of finance, it is partly brought to our attention that special funds may be used as an accounting gimmick. Nevertheless, subtle elements also have to be taken into account.

Contrary to our assertion, it would seem that some special funds having an economic reality may also be present at the cantonal level. Indeed, every canton stipulates it has funds devoted to particular tasks (cantonal hospital, cantonal roads, waste management, waste water treatments, etc.).

Nonetheless, despite their (supposed) economic reality, the use of special funds seems to be partially discretionary and in line with the use of additional depreciation charges. Consequently, their use frequently appears to be in opposition with the recommendations formulated in the HAM1 or cantonal laws. Indeed, while it is reported by cantonal administrations that the amount to be allocated to special funds is regulated by the law and mostly respects the user pays principle, it is also admitted that amounts allocated to special funds may fluctuate according to the business cycle. At the same time, it is widely admitted that amounts allocated to special funds may be higher than those forecasted if a surplus is expected during the reporting process. To back this up, the questionnaire from the canton of Thurgau (TG) says that *"in years showing good financial results, it is common to use an excess of operating revenues to allocate it to special funds"*. The discussant of the canton of Aargau (AG) corroborates this element when he reveals that *"when operating expenses are lower than those forecasted, supplementary amounts might be allocated to special funds"*. In a similar vein, it is reported in the questionnaire sent to the canton of Schaffhausen (SH) that such practices occurred when *"we wanted to save money during good years in order to use reserves during hard financial periods"*. This is the reason why it is sometimes confessed that the money coming from the Swiss National Bank in 2005 was discretionarily allocated to special funds in order to avoid large surplus.[66] That way, although the economic reality of some of these funds may not be called into questioned, bailing them out discretionary in

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[66]As demonstrated in Table 23 in Appendix C, in 2005 the net allocation to special funds is drastically higher than the annual average, revealing the discretionary characteristic of special funds when a particular event (i.e. a good news) occurs.

the sole purpose of manipulating the reported results is in opposition with the IPSAS norms philosophy. Besides, some cantonal administrations of finance do not hide the fact that the use of special funds in their canton is more or less questionable. In the canton of Neuchâtel (NE) for example, it is supported that a part of special funds refer to cookie-jar reserves. Then, in the canton of Valais (VS), special funds are obviously used as a tool of budgetary policy since it is mentioned that *"like additional depreciation charges, special funds serve to prepare the future. They have several roles to play, one of which is prevention, another is a countercyclical one, as well as a role of stabilization of the cantonal financial situation"*.

7.4 Impact of creative accounting on governments' financial performance

Interviews analysis

After having discussed additional depreciation charges and special funds, the impact of these operations on the cantons' financial situation was tackled. Regarding this question, 6 experts share the same point of view, namely that these operations have a positive effect on fiscal soundness. Auditor III, Practitioner I and Practitioner II, as well as Scholar III argue that concealing surpluses tend to put operating expenses under pressure. The level of operating expenses will therefore be lowered in the future. Consequently, Auditor III explains that *"there will be no deficits, no debt and finally no interest costs"*. To sum up, as explained by Scholar II, *"it is clear that these accruals allow to smooth the fiscal balance over time"*. Moreover, this last stance is reinforced by Practitioner II since she considers there are strategic stakes behind the resort to such practices. In her view, *"although it aims at reducing deficit by putting public spending under pressure, the other target is to increase the efficiency of public spending"*. In other words, while disposing of lower financial means, governments still have to provide equivalent public policies in terms of quantity and quality. There would thereby be an attempt aiming at defining priorities and at improving efficiency in the use of public deniers. Finally, only Auditor I does not share the same opinion as the other experts. Indeed, even though he agrees that accruals allow to put operating expenses under pressure, he cannot ensure that the money put in reserve will be used to ensure fiscal soundness over time. Conversely, with regards to his experience, he presumes the money would rather be

used for some *"guilty reasons"*, i.e. before elections.

Questionnaires analysis

According to answers received from cantonal administrations of finance, additional depreciation charges and operations on special funds appear to be generally beneficial for Swiss cantons. Indeed, 14 out of the cantonal administrations of finance consider that both accruals have allowed to improve the cantonal financial situation so far. More precisely, 5 out of the 14 cantonal administrations argue that additional depreciation charges are beneficial since they reduce ordinary depreciation charges for the coming years. As reported in the questionnaire received from the canton of Glaris (GL), additional depreciation charges *"relieve future annual accounts"*. At the same time, whereas it is justified in the canton of Appenzell Ausserrhoden (AR) that additional depreciation charges enabled large debt reduction, it is sustained in the canton of Valais (VS) that additional depreciation charges increased the retention of cash. The same point of view is supported when we investigate the impact of special funds. It is without any doubt in the canton of Graubünden (GR) that is given the best grasp of the role played by special funds on the cantonal financial situation when it is declared that *"special funds enabled to smooth results"*. Similar evidence is given for the canton of Appenzell Innerrhoden (AI) since it is revealed that *"without special funds, annual results would have been fickler"*.

Then, whereas it is asserted in 4 cantonal administrations that such practices do not impact the cantonal financial situation, it is only reported in the canton of Neuchâtel (NE) that *"discretionary operations may weigh hard on years that were first quite favorable"*.

Finally, interestingly enough, in addition to recognizing that special funds have a positive influence on the government's financial performance, stakes encompassing such accounting practices are clearly highlighted by some cantonal administrations. That way, in the canton of Nidwald (NW) it is assumed that *"when the result is null, there is no elbow room to use this equity for other purposes"*. Similarly, the canton of Uri (UR) expresses that *"we cannot know what the situation would have been if we had not resorted to additional depreciation*

charges and special funds. The only certainty is that when a large surplus occurs, citizens or the parliament want tax decreases or investment expenditure increases in the future. In 2005, additional depreciation charges certainly helped to lower those appetites". Nevertheless, although the use of accounting gimmicks is recognized in the canton of Uri (UR), it also agreed that *"the use of additional depreciation charges is detrimental for transparency of the cantonal financial situation"*. That way it is reasonably highlighted that those accounting practices allow to reduce spending appetites through a lower accounting transparency above all else. Consequently, there is almost no doubt that finance ministers have to cope with divergent interests; additional depreciation charges and operations on special funds are an appropriate means to do so and, thus, at the same time, they guarantee financial stability in Swiss cantons.

7.5 Role of finance ministers in the use of creative accounting

Interviews analysis

After having talked about the relationship between creative accounting and the cantons' financial situation, we investigated the role played by the finance ministers in the use of these operations. 3 out of the experts agree that finance ministers play a key role in the resort to such practices. However, most of the experts have more nuanced words. Whereas they all agree that finance ministers intervene at the end of the budgetary process, discussants have different points of view about the finance ministers' decision-making power. On the one hand, Auditor I, Practitioner II and Scholar III sustain that finance ministers make the decision regarding the operations to be used and the amounts to be recorded. On the other hand, Auditor II, as well as Scholar I and Scholar II argue that finance ministers do not necessarily decide alone. In these discussants' view, finance ministers prepare a proposition presented to the government and the final decision is taken collectively. That way, based on her experience, Practitioner I mentions that *"the finance minister makes the proposal to the rest of the government. And then, he has to defend his proposal in front the rest of the government and the parliament"*.

According to 4 out of them, this constitutes a form of precautionary behavior from the can-

tonal finance ministers regarding the spending appetite of other politicians, i.e. the deputies of the parliament and the spending ministers. That way, as explained by Practitioner I, by hiding surpluses, *"the money is far away from other parties"*. And Scholar II suggests that such practices *"allow to prevent possible claims from the parliament"*. In other words, Auditor III sustains that *"each time there is a surplus, deputies want to spend it"*. It must therefore be understood that *"if no surplus is viewed, it will slow down the increase of public spending as deputies will not ask for additional credits or lower tax rates"*. It is certainly Auditor II who explains the situation and the whole stakes surrounding the use of creative accounting in Swiss cantons best. *According to him, "Politicians [deputies] want to invest, this is their main objective. Then, either we depreciate or not, it does not matter. They do not have the competence to understand the depreciation process. That way, as the cash-flow from operating activities is composed by depreciation charges and the surplus, finance ministers have incentives to increases depreciation charges. The cash-flow from operating activities will be the same but operating expenses would have been put under pressure. While there is no additional expenses [during coming years], deputies keep their capacity to invest"*. This strongly highlights the fact that finance ministers strategically use accounting gimmicks and it also reveals the existence of an acting game among elected politicians, all of them acting on behalf of their own interests.

Finally, 4 experts assert that finance ministers have the possibility to resort to such accounting practices as they profit from an information asymmetry. For instance, Practitioner I argues that *"[i]t is not difficult to impose these accruals to the parliament and the other ministers as they are not aware of accounting in general"*. This is fully consistent with the words of Scholar III who claims that *"[o]nly (a) few people use accounting in parliament"*. Indeed, for Auditor III, *"competence lacks within parliament"*. That way, *"[s]ince it is very technical, other ministers and deputies do not question these operations and accept them"*.

Questionnaires analysis

In this respect, although only 14 cantonal administrations replied to the question, they almost

all share the same point of view. Each response reflects the idea that the finance minister makes a proposal and then the financial decision is taken by the parliament when reported accounts are voted. The only distinction comes from the canton of Fribourg (FR). In this canton, it would seem that the proposition issues from the cantonal administration of finance and is approved by the finance minister. Consequently, it is obvious that finance ministers play a key role in the direction of such accounting practices

7.6 Summary and discussion of the results

In the light of the information obtained in both analysis, strong evidence supports the hypothesis we have formulated throughout this research.

The first clues tend to demonstrate that additional depreciation charges and operations on special funds are mainly used in order to manipulate reported public figures. Nevertheless, interestingly enough, there is no consensus on whether those practices must be considered as creative accounting. Indeed, while discussants and cantonal administrations of finance agree that finance ministers play with both accruals to hide surpluses, experts sometimes argue that such operations are not cosmetic because they are legal. The way the legalistic vision of accounting still pervades in practitioners is very surprising. According to this vision, all practices should be accepted and/or could be justified if they are legal and even if they tend to violate the essence of accounting, i.e. provide reliable information to anyone who would need it. However, according to our point of view, this vision is outdated. Accounting is changing, specifically under the pressure of IPSAS boards. Consequently, the definition and the study of creative accounting also has to embrace this new trend. Indeed, if accounting moves from a legalistic vision to an economic one, the definition of creative accounting must also incorporate this change. It therefore makes sens to interpret both operations in light of the definition formulated in subsection 5.3.

Then, although their apparent indecision in deciding whether additional depreciation charges and special funds have to be considered as creative accounting, both groups of experts widely support the idea that those accruals allow to reach a better financial situation. Nonetheless, both groups of experts do not completely confirm our hypothesis which is that

additional depreciation charges and operations on special funds allow to simultaneously put public spending under pressure and to generate higher revenues. According to their belief, both accruals avoid finance ministers facing claims for higher public spending and/or tax cuts above all else. And if additional depreciation charges engender lower operating expenses over the years, it is mainly due to the fact that ordinary depreciation charges would be lower in the future. Results ensuing from empirical analysis will confirm whether our hypothesis is true.

Finally, our assertion stipulating that finance ministers play a fundamental role in the resort to such practices also appears to be validated by both groups of experts. Even though some discussants, especially those part of cantonal administrations, employ more prudent speech and declare that finance ministers only make the proposal for the parliament, our argument remains convincing. Indeed, as debated with some experts, deputies drastically lack competences in accounting. That is why, although the final decision is in their hands, finance ministers profit from information asymmetry. In other words, we may expect deputies not to be fully aware about what they vote when accounting is the subject. We may thus reasonably argue it is justified to handle the impact of finance ministers on the use of such accounting practices in Swiss cantons.

8 Quantitative impact of creative accounting on governments' financial performance

In this section, we model the influence of creative accounting on governments' financial performance. First, we present the set of variables we use in the research. We then present both econometric models used to test the hypothesis previously formulated. Indeed, we resort to two complementary approaches: (1) a single equation model directly estimating the impact of additional depreciation and special funds on future balances and alternatively (2) a system of two simultaneously estimated equations, one for the operating revenues and one for the operating expenses, which models the influence of creative accounting on governments' financial performance. The respective estimation strategies are also presented for each model. Finally, we report and discuss the results.

8.1 Variables[67]

Dependent variables

The dependent variable used is "Balance" (B) - for the single equation model - which is the cantonal corrected balance as defined in subsection 6.3. As a reminder, "Balance" (B) may be either positive in a case of surpluses ("Surplus" - S) or negative in a case of deficits ("Deficit" - D). The variable of interest is expressed in real term per capita. Then, the variables "Revenue" (R) and "Expense" (E) - for the simultaneous equations model - that respectively refer to the corrected operating revenues and expenses are used. Both variables are also expressed in real terms par capita.[68]

Variables of interest

As main explanatory variables, we use the first lag of our variables of interest, namely "ADC(-

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[67]Table 10 below reports summary statistics for variables used in the model explaining the balances of the statement of financial performance.

[68]Moreover, in addition to creative accounting operations, both variables have been adjusted for particular events as explained in appendices D and E. Values for corrected operating revenues and expenses are respectively presented in Appendix in tables 24 and 25.

1)" and "SF(-1)". The first lag of these two variables reflects the fact that creative accounting operations booked in the reported financial statement of year *t-1* are expected to almost immediately influence the governments' financial performance ("Balance"), as demonstrated in the section devoted to the hypothesis. Additional depreciation charges and net allocations to special funds reported in year *t-1* should alleviate claims for additional operating expenses and/or for tax cuts in year *t* already.

Control variables

To isolate the effect of our variables of interest ("ADC(-1)" and "SF(-1)"), we also control for the influence of other variables on public balances. For each control variable, we mention how the variable is compiled, its own expected effect on governments' financial performance as well as the source of the information we used.

The control variables introduced in models explaining the balances of the statement of financial performance are as follows:

Lagged dependent variables ("Revenue(-1)", "Expense(-1)" and "Balance(-1)") are first included to reflect that operating revenues and operating expenses, and therefore the balance of the statement of financial performance, are not independent from their past level. They may largely suffer from temporal inertia in particular because governments frequently resort to incremental budgeting (Ibrahim and Proctor 1992).

"Error" is a variable reflecting the tax revenue budgeting error. It is the difference between the forecasted amount of tax revenues and the eventually cash-in revenues. As shown by Chatagny and Soguel (2012b), finance ministers in the Swiss cantons generally strategically underestimate tax revenues during the budgeting process in order to restrain the candy store mentality of spending ministries ("Error" < 0). Underestimating tax revenues should therefore decrease deficits. The variable is expressed in real terms per capita.

"Growth" refers to the business cycle and is measured by the GDP growth rate. The latter influences the level of operating revenues, operating expenses and therefore reported balances. Because of the automatic stabilizers, the GDP growth rate is expected to influence

the operating revenues positively and the operating expenses negatively. However, Martin and Soguel (2004) show that Swiss cantons may be inclined to adopt a pro-cyclical behavior; operating expenses would therefore increase during periods of economic growth. The final effect of the GDP growth on governments' financial performance is thus uncertain. As the GDP growth rate does not exist for Swiss cantons, we use the national GDP growth rate computed by the State Secretariat for Economic Affairs (SECO). Finally, this variable is expressed as a percentage.[69]

At the same time, "Unemployment" causes an increase in operating expenses and a decrease in operating revenues. Therefore, a higher unemployment rate should induce degradation of public surpluses. The independent variable we use is the cantonal unemployment rate as a percentage of the active population.[70]

"Election" refers to years during which cantonal governments are elected. According to Schuknecht (2000), Shi and Svensson (2002) and then Veiga and Veiga (2007), governments would tend to increase public spending and reduce public revenues during an election year in order to raise their reelection chances. This phenomenon is commonly known as the political-budget cycle and tends to deteriorate reported balances. The effect of upcoming elections is captured by a dummy variable taking the value 1 during election years and 0 otherwise.[71]

"Government" reflects the average political ideology of cantonal governments. Right-wing governments have been shown to spend less than the ones leaning to the left (Tellier 2006), although this finding is put into question (Imbeau and Tellier 2004). This variable controls both the proportion of conservative ministers in the cantonal governments and their political leanings.[72]

"Concordance" measures the solidarity between the executive and the legislative powers.

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[69]Instead of taking into account the GDP growth rate, it is sometimes argued that the output gap (i.e. the difference between the actual GDP and the potential GDP) would be more appropriate to capture the influence of the business cycle on fiscal soundness. For several reasons, we contest this statement. Indeed, whereas after a peak the output gap is still positive, the economic growth is yet dropping. In such a situation, in spite of the positive output gap, tax revenues are lower and social expenses higher, resulting thus in lower financial performance. Inversely after a through, whereas the output gap is negative, the economy is recovering. The tax revenues should therefore increase and social expenses decrease, resulting thus in better financial performance.

[70]Data are provided by the State Secretariat of Economic Affairs (SECO).

[71]Data relative to election years were collected from Année politique suisse, BADAC and Swiss Federal Statistics Office (SFSO).

[72]A detailed operationalization of the variable is proposed in Appendix M.

This relationship may also influence the level of operating revenues, operating expenses and therefore the level of public deficits. According to Roubini and Sachs (1989) and Volkerink and De Haan (2001), if there is no concordance between both powers, they will probably face difficulties reaching agreements. Authors believe that such a situation results in excessive overall public spending, and that public deficits would therefore be higher or at least public surpluses should be smaller. Finally, the variable is measured by the proportion of government parties represented in parliament.[73]

"Coalition" is the political fragmentation of cantonal governments. As revealed by Roubini and Sachs (1989) and more recently by Volkerink and De Haan (2001), the number of parties in government may have an impact on reported figures. Their findings indicate that the more there are parties coexisting within government, the higher public deficits will be. We introduce an indicator of political fragmentation measured by the number of parties in cantonal governments.[74]

"Departments" expresses the number of departments in cantonal administrations. Valesco (2000) sees the government's budget as a common good pulled by various interest groups. Therefore, a large number of stakeholders within an administration would lead to higher public spending. This would be explained by the fact that departments, that are headed by a spending minister (by contrast to the ministry of finance headed by the finance minister), would try to maintain or increase their own budget. This being said, we can reasonably expect that a higher number of cantonal departments should result in stronger pressure to increase or at least maintain public spending at a high level. Thus, if it were true, a larger number of departments should be associated with higher public deficits or lower public surpluses.[75]

"Elderly" captures the percentage of the cantonal population over 65 years old. We expect a larger share of elderly in the canton's population should generate higher healthcare and social expenses (Feld and Matsusaka 2003). Following this, a canton with an older population should engender larger public deficits.[76]

Financial referendums ("Referendum") and popular initiatives ("Initiative") are two in-

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[73]Source: Swiss Federal Statistics Office (SFSO).
[74]Source: Année politique suisse.
[75]Source: BADAC
[76]Source: Swiss Federal Statistics Office (SFSO).

stitutional tools mainly used in Switzerland, which is a direct democracy, that can affect governments' financial performance. Financial referendums may influence public spending in two ways (Feld and Kirchgässner 2000). First of all, they allow citizens to express their views concerning spending that are put to the vote. They also cause governments to self-regulate and to pay close attention to public spending if they do not want their projects to be subjected to the ballot. In consequence, the more binding a financial referendum is (they are more or less restrictive depending on the canton), the more it will lower spending. We therefore presume that financial referendums reduce public deficits or improve public surpluses. Popular initiatives, on the other hand, give citizens the opportunity to suggest new laws or modifications of the constitution. Their suggestions can lead increases, as well as decreases of public spending. The effect of initiatives on public deficits is therefore unknown. To measure the degree of severity that financial referendums and popular initiatives can have, we use the operationalization suggested by Stutzer and Frey (2000).[77]

"Rule" indicates the stringency of cantonal fiscal rules. Previous works (Feld and Kirchgässner 2008; Luechinger and Schaltegger 2011) support the idea that fiscal rules force governments to lower public deficits and to show a positive structural balance of the statement of financial performance over time. The variable reflecting the stringency of the fiscal rules is the one proposed by Luechinger and Schaltegger (2011), where the value is 3 in case the rule of the canton is among the most stringent, 2 where the rule is fairly stringent, 1 for the least stringent and 0 otherwise (no rule).[78]

"Creative * Rule" is an interaction variable between creative accounting operations ("ADC(-1)" and "SF(-1)") and budget rules ("Rule"). Drazen (2002) and Von Hagen and Wolff (2006) suggest that the more binding the fiscal rule is, the more governments would be incited to engage in creative accounting. Since both fiscal rules and creative accounting operations are expected to improve the cantons' financial performance, the interaction variable should also highlight a positive sign.

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[77]The operationalization of the variable is presented in Appendix N.
[78]This operationalization was first proposed by Feld and Kirchgässner (2008).

Table 10: Summary statistics

Variables	Definition / Unit of measurement	Source	Mean	Std. dev.	Min	Max	N
Balance	SPER-balance in real CHF per capita	Cantonal financial accounts	129.777	533.207	-3'158.800	2'376.233	729
Surplus	Balance > 0; in real CHF per capita	Cantonal financial accounts	384.615	402.320	1.080	2'376.230	470
Deficit	Balance < 0; in real CHF per capita	Cantonal financial accounts	-332.670	418.341	-3'158.800	-1.680	259
ADC(-1)	lagged ADC in real CHF per capita	Cantonal financial accounts	108.250	255.092	0.000	2'827.581	728
SF(-1)	lagged SF in real CHF per capita	Cantonal financial accounts	29.178	266.949	-2'382.663	3'728.937	728
Balance(-1)	lagged SPER-balance in real CHF per capita	Cantonal financial accounts	130.000	533.539	-3'158.800	2'376.233	728
Error	direct tax revenue budgeting error in real CHF per capita	Cantonal financial accounts	-88.038	230.017	-2'150.996	1'231.055	858
Growth	swiss economic growth rate	SECO	1.754	1.642	-1.937	4.376	858
Unemployment	cantonal unemployment rate in percent of the active population	SECO	2.130	1.732	0.000	7.800	858
Elderly	percentage of the population over 65 old	SFSO	14.990	2.186	10.142	21.756	858
Government	percentage of the members of the government cabinet belonging to right-wing parties	APS	5.546	0.508	4.220	7.057	858
Coalition	number of political parties in the government cabinet	BADAC / APS	3.432	0.911	1.000	5.000	858
Concordance	percentage of the seats in the parliament that are occupied by members of parties represented in the government	APS	0.837	0.141	0.000	1.000	858
Departments	number of departments in the cantonal administration	BADAC	7.179	2.191	4.000	13.000	858
Election	dummy taking the value 1 in election years	APS	0.261	0.439	0.000	1.000	858
Initiative	Stringency of cantonal popular initiatives	BADAC / FKF / APS / SFSO	4.567	1.136	2.333	6.000	858
Referendum	Stringency of cantonal financial referendums	BADAC / FKF / APS / SFSO	3.947	1.191	1.000	6.000	858
Creative * Rule	Interaction variable	Cantonal financial accounts	54.086	368.690	-4'734.920	4'406.164	728

Année Politique Suisse (APS), Database on Swiss cantons and Towns (BADAC), Fachgruppe für Kantonale Finanzfragen (FKF), Swiss Federal Statistical Office (SFSO)

8.2 Endogenous covariates

In empirical research, it is essential to cope with endogeneity since estimated parameters may become biased and inconsistent (Kristensen and Wawro 2003). This is why, in this subsection, we present endogenous regressors and provide some valid instruments (see tables 31 and 32 in Appendix P).[79]

Firstly, we expect that the tax revenue budgeting error ("Error") may be endogenous. Indeed, since current tax revenues are used to compute the indicator of tax revenue budgeting error, simultaneity in the determination of both the public deficits and the current tax budgeting revenue error might exist. The first difference of the tax revenue budgeting error is used as an instrument, as proposed by Chatagny and Soguel (2012b).

Secondly, it is sometimes assumed that financial institutions are endogenous as they are influenced by the financial situation. Consequently, depending on the level of public deficits, politicians could be tempted to adapt the stringency of these financial institutions. Based on other research about Swiss cantons (Feld and Matsusaka 2003; Martin 2008), we consider the financial referendums ("Referendum"), the popular initiatives ("Initiative"), as well as the budget rules ("Rule") as endogenous.[80] Since our data do not exhibit second order autocorrelation, we use the second lagged value of the concerning variables as instruments.[81]

8.3 Estimation strategies

In the current subsection, we present both estimation strategies employed in order to solve our research question. Respectively, we first present the single equation model and only after do we expose the simultaneous equations model.

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[79]Instruments proposed in this subsection are used when 2SLS, GMM and 3SLS estimators are performed.

[80]However, Alesina and Perotti (1996) argue that the endogeneity of such financial institutions may be called into question.

[81]The choice of the lagged value as instruments is motivated by the works of Martin (2008), Krishnakumar et al. (2010) and Chatagny and Soguel (2012b) who use the same methodology. Although these instruments sometimes appear to be quite controversial, no better instrument has been provided so far.

Single equation model

In order to identify the determinants of the balances of the statement of financial performance as well as testing our hypothesis, we first test the following model:

$$B_{i,t} = \alpha + \delta ADC_{i,t-1} + \vartheta SF_{i,t-1} + \beta X_{it} + \mu_i + \epsilon_{it}$$

where B is the dependent variable representing the corrected balances of the statement of financial performance of Swiss cantons. ADC and SF respectively refer to our variables of interests and δ as well as ϑ are their respective associated coefficients and where α represents the intercept. Then, X is the vector of control variables and β is the corresponding vector of coefficients. Furthermore, μ refers to the cantonal fixed effects. The error terms are represented by ϵ. Lastly, $_i$ and $_t$ denote Swiss canton "i" and year "t".

Moreover, as formulated in Subsection 4, it is hypothesized that creative accounting should improve the balance of the statement of financial performance over time. However, through the estimation strategy proposed above, we cannot express whether such an eventual improvement of the financial situation is due to larger public surpluses, lower public deficits or a combined effect of both phenomenons. To answer this question, we re-estimate the single equation model presented above twice by replacing the dependent variable ("Balance" - B) by either "Surplus" (S) when operating revenues are larger than operating expenses (Balance > 0) or by "Deficit" (D) when there is an excess of operating expenses over operating revenues (Balance < 0).

Then, in order to ensure the significance and the consistency of our results, some elements must be taken into account. First of all, for different reasons, Swiss cantons are relatively heterogeneous in terms of budget size. That way, as highlighted by the Breusch-Pagan/Cook-Weisberg test, the error terms strongly suffer of heteroskedasticity, although the model is expressed per capita.[82] Secondly, serial correlation is also an issue as most of the variables depend on their past values. Despite the inclusion of a lagged dependent variable in the model, the Wooldridge test for autocorrelation reveals the presence of serial correlation of order one.[83] Nevertheless, the Arellano-Bond test does not confirm the presence of

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[82] Results of the Breusch-Pagan/Cook-Weisberg test are presented in Table 33 in Appendix P.

[83] Results presented in Table 34 in Appendix P demonstrate the presence of serial correlation of order one.

autocorrelation of order two.[84] Thirdly, as cantons are part of the same country, error terms may be contemporaneously correlated. Fourthly, in the light of the cantons heterogeneity, we include cantonal fixed effects in our models.[85] These fixed effects allow to capture cantonal differences that can hardly be measured or observed in reality. The Breusch and Pagan test, as well as the Hausman test, validate our decision to include cantonal fixed effects.[86] Furthermore, as argued by Nerlove and Balestra (1996), the inclusion of fixed effects is more relevant than random effects when studying a full population, i.e. the 26 Swiss cantons. However, the inclusion of cantonal fixed effects has a drawback, which is that it increases multicolinearity.[87] Fifthly, it must be noted that our panel is unbalanced as not every Swiss canton had adopted the HAM1 in 1980. Nevertheless, it does not cause any econometric problem since the HAM1 has been randomly implemented over time by cantons. In other words, the reasons why some data are missing for some cantons are exogenous.[88] Then finally, remember that our panel is based on the 26 Swiss cantons (I = 26) over the period 1980 - 2012 (T = 33); the time series is therefore longer than the cross section. Nevertheless, according to Beck (2004), econometric estimators are more adapted to cases where the inverse occurs.

Given the above mentioned characteristics of our data, five different econometric estimators are considered. Firstly, we use an OLS estimator including cantonal fixed effects and where error terms are corrected according to the White procedure. The White correction allows to cope with heteroskedasticity and autocorrelation and simultaneously implements clustered standard errors at the cantonal level. Secondly, we consider an estimator proposed by Baltagi and Wu (1999) which fits a cross sectional time series regression model when the

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[84]Results of the Arelano-Bond test are presented in Table 35 in Appendix P.

[85]However, following the methodology employed by Martin (2008) and Chatagny and Soguel (2012b), time fixed effects are not incorporated in the current model. The inclusion of such fixed effects increases the risk of multicolinearity, notably with the control variables "Growth" and "Unemployment". In addition, both variables (due to their properties) also allow to capture particular events that could affect Swiss cantons. Finally, as detailed in Appendix D, E, K and L, operating revenues and operating expenses have been cleaned of exceptional components (e.g. money received from the Swiss National Bank in 2005), which also reduces the need for time fixed effects.

[86]Results ensuing from both tests are presented in Appendix P in tables 36 and 37 respectively.

[87]The Variance Inflation Factors (VIF) of explanatory variables are reported in Table 38 in Appendix P.

[88]According to most of experts interviewed in the framework of the qualitative analysis, the introduction of the HAM1 in Swiss cantons mainly depended on the finance ministers' willingness or on the one of the directors of cantonal finance administrations. As the implementation of a new accounting guideline is tough and time consuming, finance ministers sometimes gave priority to more delicate subjects in the short-run. Moreover, Scholar II reported that directors of cantonal finance administrations or finance ministers close to retirement sometimes also enjoyed leaving this job to their successors.

error terms are first order correlated (REGAR). This estimator is particularly relevant as it has been specially developed in order to support exogenously unbalanced panel data and may incorporate fixed effects. Thirdly, we use the Panel Corrected Standard Error (PCSE) estimator proposed by Beck and Katz (1995). This estimator has the advantage of correcting heteroskedasticity and contemporaneous correlation. Then, if needed, it also allows first order autocorrelation to be dealt with. Furthermore, the panel does not need to be balanced and the estimator works efficiently when the cross section is smaller than the time series. However, cantonal fixed effects cannot be included. Fourthly, as these first three estimators cannot deal with endogeneity issues, we also estimate our model through the Two Stage Least Square (2SLS) estimator. Moreover, by applying the White correction which produces robust standard errors, heteroskedasticity and serial correlation are taken into account. Standard errors are also clustered at the cantonal level. Then, the 2SLS estimator supports the inclusion of cantonal fixed effects and handles exogeneously unbalanced panel data. Nevertheless, the 2SLS estimator is not time series asymptotic conversely to the PCSE estimator. Fifthly, we employ the system-GMM procedure discussed by Arellano and Bover (1995), Blundell and Bond (1998) and Roodman (2009). This estimator is relevant since it is especially efficient for dynamic panels including individual fixed effects. Moreover, it allows to deal with endogeneous regressors by taking the lags of the corresponding variables as instruments. System-GMM also allows standard errors to be robust to heteroskedasticity and patterns of autocorrelation within individuals, equivalent to clustered standard errors at the individual level (Roodman 2009). Nevertheless, system-GMM is more efficient for relatively short panels, i.e. when the time series is smaller than the cross-section (T < I). Finally, since fixed effects are automatically included in system-GMM and given that some of the regressors are time-invariant, their respective parameters may be inflated due to multicolinearity.[89]

Simultaneous equation model

In the previous model, we assume there is no relation of simultaneity between operating

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[89]Indeed, as shown in Table 38 (Appendix P), multicolinearity may be an issue when individual fixed effects are incorporated into models.

revenues and operating expenses. However, as we know, by definition the balance of the statement of financial performance ("Balance" - B) is determined by the difference between the operating revenues ("Revenue" - R) and the operating expenses ("Expense" - E). Resorting to a simultaneous equations model allows to resolve this drawback. At the same time, using such a simultaneous equations model allows to distinguish the respective determinants of operating revenues and expenses that eventually affect public deficits. Moreover, while the level of operating revenues will determine the level of operating expenses for a large part, the latter should also influence the operating revenues to be collected by the government. As a consequence, operating revenues ("Revenue" - R) and operating expenses ("Expense" - E) are explanatory endogenous variables. Finally, as previously formulated, we expect that creative accounting allows governments to save money by restraining a high tax burden and by avoiding increases in operating expenses. In other words, we hypothesize that creative accounting operations improve the balance of the statement of financial performance by increasing operating revenues and by decreasing operating expenses. According to what is exposed above, running a simultaneous equations model is all the more relevant from both econometric and economic points of views. The model is thus formulated in two equations, one for the operating revenues and the other for the operating expenses, as follows:

$$R_{i,t} = \alpha^R + \delta^R ADC_{i,t-1} + \vartheta^R SF_{i,t-1} + \gamma^R E_{i,t} + \beta^R W_{i,t} + \mu_i + \epsilon_{i,t}^R$$

$$E_{i,t} = \alpha^E + \delta^E ADC_{i,t-1} + \vartheta^E SF_{i,t-1} + \gamma^E R_{i,t} + \beta^E Z_{i,t} + \mu_i + \epsilon_{i,t}^E$$

where α^R and α^E represent the intercepts. δ^R and δ^E, respectively ϑ^R and ϑ^E are the coefficients associated with our variables of interest, ADC and SF. γ^R measures the marginal effect of operating expenses on operating revenues and γ^E the marginal effect of operating revenues on operating expenses. W and Z are the set of control variables explaining operating revenues and operating expenses and β^R and β^E are their associated coefficients. Although they include the same set of control variables, W and Z are still different as they each include the lag of the dependent variable of their respective equation. Furthermore, μ refers to the cantonal fixed effects. Then, ϵ^R and ϵ^E are the error terms. Finally, $_i$ and $_t$ denote Swiss

canton "i" and year "t".

In order to precise our investigation and to determine through which phenomenon the governments' financial performance is eventually improved, we re-estimate the simultaneous equations model in cases of surpluses and of deficits. Concretely, we test the respective influence of creative accounting on operating revenues ("Revenue" - R) and on operating expenses ("Expense" - E) when the balance of the statement of financial performance is either positive (Revenue > Expense) or negative (Revenue < Expense).

The simultaneous equations model discussed above will be tested with the Three Stage Least Square (3SLS) estimator developed by Zellner and Theil (1962). Then, heteroskedasticity is taken into account by correcting error terms through the White procedure and cantonal fixed effects are included in the model. Finally, the 3SLS estimator also allows us to use instrumental variables regarding the above mentioned endogenous regressors.

8.4 Results

In the current subsection, we provide results related to the explanation of the governments' financial performance and how it is influenced by creative accounting operations. More particularly, we first report results ensuing from the single equation model and secondly those obtained through the simultaneous equations model.

Single equation model

Table 11 below reports results from the single equation model explaining the level of the **balance of the statement of financial performance** as a whole (i.e. when "Balance" is the dependent variable). We first note that not all explanatory variables are individually significant. Nonetheless, the joint statistic (F-statistics and Chi2) indicates that the coefficients are jointly significantly different from zero. Some independent variables are indeed strongly statistically significant.

The parameter associated with the variable "ADC(-1)" highlights a positive and significant relationship with the balance of statement of financial performance. This is robust since it

holds whatever the estimators we use. We can conclude that the additional depreciation charges improve the balances of the statement of financial performance in the future. Results ensuing from the OLS estimator highlight that 1 additional CHF per capita recorded as additional depreciation charges engenders an increase of public balances per capita by about 0.31 CHF. The coefficients computed through REGAR and 2SLS are relatively homogenous whereas PCSE and GMM estimators provide a substantially larger coefficient. Then, as for the variable "SF(-1)", the result is less clear. Indeed, although the coefficient exhibits the expected sign, results do not reveal any significant relationship between the net allocation to special funds and the balance of the statement of financial performance. Additionally and conversely to our hypothesis, the cumulative effect of both creative accounting operations and fiscal rules ("Creative * Rule") has no significant influence on the balance of the statement of financial performance even if the variable brings out a positive coefficient, as expected.

Then, among all control variables included in the model, some of them also appear to have significant and robust effects on governments' financial performance. The lagged dependent variable, as well as the revenue budgeting error have very significant and robust effects on governments' financial performance. Firstly, the lagged dependent variable ("Balance(-1)") turns out to be strongly significant with all five estimation strategies. Its coefficient is positive, as expected, and is included between 0.279 and 0.415. This result confirms an intertemporal intertia in the budgeting process. In other words, the budgeting process in year t strongly relies on the already known reported values of year t-1. Considering results obtained through the OLS estimator, a surplus of 1 CHF per capita in year t-1 will result in a surplus of 0.37 CHF per capita in the subsequent year. Secondly, the underestimation of tax revenues ("Error") also strongly impacts the balance of the statement of financial performance. Moreover, the coefficient reveals a negative sign, as expected. This means that the underestimation of tax revenues during the budgeting process allows governments to improve the balance of the statement of financial performance. Quantitatively, a tax revenue underestimation of 1 CHF per capita increases public balances by about 0.47 CHF per capita if we consider the results obtained through the OLS estimator.

Table 11: Results of the single equation model

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.315***	0.317***	0.373***	0.306***	0.380***
	(0.085)	(0.073)	(0.081)	(0.081)	(0.075)
SF(-1)	0.088	0.104	0.046	0.075	0.083
	(0.101)	(0.074)	(0.114)	(0.105)	(0.067)
Balance(-1)	0.373***	0.279***	0.345***	0.386***	0.415***
	(0.077)	(0.038)	(0.078)	(0.075)	(0.074)
Error	-0.476***	-0.498***	-0.492***	-0.409***	-0.491***
	(0.106)	(0.075)	(0.130)	(0.179)	(0.068)
Growth	22.349**	18.963*	17.204	24.180***	19.955**
	(10.024)	(10.542)	(13.647)	(8.495)	(9.776)
Unemployment	-24.536*	-30.981**	-36.391**	-24.905*	-28.682***
	(13.409)	(14.769)	(14.666)	(14.578)	(10.010)
Elderly	-18.038	-15.808	-8.544	-12.104	-10.124*
	(16.947)	(19.584)	(16.785)	(18.438)	(5.865)
Government	-143.427***	-150.355***	-79.073	-157.877***	-68.308**
	(40.570)	(52.824)	(48.119)	(46.878)	(31.229)
Coalition	20.911	22.233	20.078	22.980	13.676
	(29.153)	(40.281)	(22.499)	(30.702)	(14.604)
Concordance	25.763	24.686	108.638	37.496	135.062
	(77.896)	(139.117)	(114.593)	(70.530)	(103.307)
Departments	-7.016	-5.116	7.572	-7.887	-7.584
	(6.645)	(14.001)	(7.796)	(5.390)	(5.310)
Election	-5.033	-3.709	2.440	-6.377	-2.858
	(38.291)	(34.812)	(39.333)	(36.499)	(36.388)
Initiative	80.656	106.031	64.643**	77.408	58.105***
	(62.790)	(93.137)	(26.421)	(83.548)	(16.359)
Referendum	-34.277	-41.264	-10.901	-54.604	-10.141
	(27.432)	(42.266)	(20.149)	(35.914)	(11.045)
Rule	53.853	70.616*	15.896	10.342	20.115
	(49.481)	(40.055)	(20.978)	(49.610)	(24.749)
Creative * Rule	0.029	0.021	0.046	0.051	0.009
	(0.050)	(0.053)	(0.082)	(0.053)	(0.019)
Constant	782.806**	568.514	249.993	880.202	207.337
	(347.196)	(534.765)	(315.297)	(736.810)	(223.843)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	0.429	0.414	0.379	0.354	-
F-stat / Chi2	62.190	15.950	288.960	399.400	1637.980
p-value	0.000	0.000	0.000	0.000	0.000
N	712	686	712	703	686

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

The variable "Unemployment" shows robust but lower significant effects on public balances. Indeed, the variable is mainly statistically significant at the 95% and 90% levels. A statistical significance at the 99% level is only offered by the system-GMM. However, its associated coefficient has the expected negative sign revealing that a higher unemployment rate decreases the balance of the statement of financial performance. Conversely, the variable measuring the government average political leaning ("Government") has strong but unstable robust effects. In addition, the coefficient boasts a negative sign suggesting that more right-wing governments are associated with lower financial performance. While this result is strongly robust when we consider the OLS, REGAR and 2SLS estimators, the variable turns out to be insignificant with the PCSE estimator. Moreover, although the coefficient remains negative, its value is twice as low regarding the values obtained from the three other estimators. As to the coefficient estimated through system-GMM, its value is also relatively small compared to values obtained with other estimators and it reveals a statistical significance at the 95% level only.

A similar conclusion may be drawn as to the economic growth rate ("Growth"). While the associated coefficient is positive and mostly stable, revealing that higher economic growth rates are associated with larger balances of the statement of financial performance, the statistical significance may be questioned. Indeed, "Growth" is significant at the 99%, 95% and 90% levels and appears insignificant with the PCSE estimator. Finally, since the remaining control variables have insignificant effects on reported balances, they do not require any particular discussion.

Then, Table 12 below presents results for the model exclusively assessing **the impact of creative accounting operations on public surpluses** (i.e. when "Surplus" is the dependent variable). In the light of the model devoted to the explanation of public surpluses, the parameter associated to the variable "ADC(-1)" highlights a positive and significant relationship with the variable "Surplus". This suggests that additional depreciation charges improve future surpluses. Besides, results appear to be robust since they hold whatever the considered estimator is. Moreover, the variable is statistically significant at the 99% level.

Table 12: Results of the single equation model with "Surplus" as dependent variable

	OLS	REGAR	2SLS	GMM
ADC(-1)	0.235***	0.332***	0.224***	0.309***
	(0.076)	(0.079)	(0.077)	(0.120)
SF(-1)	0.100*	0.159***	0.102*	0.089*
	(0.060)	(0.062)	(0.061)	(0.051)
Surplus(-1)	0.358***	-0.086	0.361***	0.466***
	(0.055)	(0.063)	(0.058)	(0.053)
Error	-0.477***	-0.437***	-0.363***	-0.449***
	(0.075)	(0.076)	(0.110)	(0.082)
Growth	15.047	0.782	18.948*	15.839**
	(10.113)	(10.255)	(10.378)	(7.947)
Unemployment	-12.433	-39.192	-12.472	2.057
	(19.175)	(28.242)	(19.821)	(11.754)
Elderly	-9.332	44.834	-5.918	1.727
	(18.656)	(29.635)	(19.112)	(5.875)
Government	-154.177***	-188.798***	-164.031***	-89.998**
	(60.988)	(73.069)	(64.309)	(38.878)
Coalition	4.115	38.946	8.470	37.515**
	(38.981)	(55.347)	(42.085)	(18.890)
Concordance	13.097	-58.459	17.442	38.712
	(116.252)	(180.107)	(122.389)	(56.256)
Departments	-18.848	11.050	-15.508	0.631
	(16.132)	(21.005)	(19.475)	(6.940)
Election	27.850	42.494	24.265	25.572
	(36.273)	(31.447)	(36.573)	(45.764)
Initiative	81.122	192.546**	103.678	48.421***
	(86.456)	(93.548)	(161.451)	(15.710)
Referendum	-71.330	-106.000	-79.590	8.582
	(43.870)	(71.785)	(70.819)	(10.980)
Rule	42.490	61.019	17.846	20.181
	(40.733)	(63.069)	(66.571)	(15.286)
Creative * Rule	0.017	-0.030	0.025	-0.020
	(0.044)	(0.043)	(0.047)	(0.028)
Constant	1132.261*	83.569	1043.430	105.406
	(641.849)	(89.570)	(889.049)	(208.379)
Cantonal FE	YES	YES	YES	YES
R-Squared	42.440	14.510	43.080	-
F-stat / Chi2	12.830	4.930	940.520	8346.720
p-value	0.000	0.000	0.000	0.000
N	377	351	373	363

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Results ensuing from the OLS estimator reveal that 1 additional CHF per capita recorded as additional depreciation charges engenders an increase of public surpluses of 0.23 CHF per capita . Whereas it is consistent with results obtained through the 2SLS estimator, REGAR and GMM estimators generate larger coefficients. As for the variable SF(-1), results are less clear even if parameters are positive. Indeed, whereas results suggest that the net allocation to special funds is associated with larger surpluses, the variable is only significant at the 90% level in models ran by OLS, 2SLS and GMM. Moreover, these three estimators produce relatively comparable coefficients. But when looking at results ensuing from the REGAR estimator, the variable "SF(-1)" appears to be statistically significant at the 99% level and its associated coefficient is larger than usual. Considering this, a net allocation to special funds of 1 CHF per capita would increase public surpluses by about 0.15 CHF per capita. However, as a whole, the influence of special funds on public surpluses should be interpreted with caution regarding the small statistical significance of the variable.

Now, Table 13 below concentrates on the model especially devoted to **the impact of creative accounting on public deficits** (i.e. when "Deficit" is the dependent variable). Considering the impact of additional depreciation charges on public deficits, results show that the parameter associated to the variable "ADC(-1)" is positive. Amounts recorded as additional depreciation charges in year *t-1* are thus supposed to alleviate public deficits of the subsequent year. However, the variable is only statistically significant at the 90% level when estimated through the OLS and 2SLS estimators. The variable is then no longer significant when the model explaining public deficits is estimated with REGAR and GMM estimators. Additional depreciation charges do not appear as being key determinants of future public deficits. Similar evidence may also be drawn as to the impact of special funds on public deficits. Although the coefficient of the variable "SF(-1)" is positive, the variable is not statistically significant. That way, neither additional depreciation charges nor operations on special funds significantly influence the level of public deficits over time. As a consequence, results obtained through single equation models demonstrate that creative accounting only structurally improves governments' financial performance by increasing public surpluses over time.

Table 13: Results of the single equation model with "Deficit" as dependent variable

	OLS	REGAR	2SLS	GMM
ADC(-1)	0.275*	0.258	0.319*	0.229
	(0.148)	(0.158)	(0.170)	(0.152)
SF(-1)	0.198	0.129	0.165	-0.096
	(0.227)	(0.253)	(0.261)	(0.215)
Deficit(-1)	0.232***	0.096	0.179**	0.571***
	(0.075)	(0.089)	(0.091)	(0.079)
Error	-0.445***	-0.467***	-0.551***	-0.230
	(0.118)	(0.131)	(0.190)	(0.196)
Growth	40.052***	13.746	34.637**	37.264***
	(13.522)	(17.140)	(16.107)	(9.962)
Unemployment	2.389	-5.729	7.795	-5.078
	(12.163)	(17.386)	(15.588)	(12.932)
Elderly	3.872	14.328	10.003	-17.437
	(21.680)	(28.868)	(26.083)	(18.061)
Government	-101.216**	-134.029	-149.119**	-34.569
	(48.825)	(65.231)	(63.578)	(36.297)
Coalition	-56.362	-113.132	-129.904	-50.166
	(58.867)	(85.356)	(89.381)	(34.052)
Concordance	8.551	95.269	282.001	284.633
	(300.973)	(441.969)	(463.172)	(283.780)
Departments	26.296**	23.229	27.398**	-8.199
	(11.972)	(14.766)	(13.053)	(11.416)
Election	-19.650	18.723	-11.879	-35.402
	(37.262)	(38.785)	(40.623)	(34.674)
Initiative	99.033	111.158	46.099	27.671
	(111.841)	(115.056)	(315.614)	(23.647)
Referendum	-30.284	-50.256	133.563	-11.547
	(47.780)	(61.194)	(154.740)	(18.010)
Rule	0.466	56.885	-41.379	-44.163*
	(52.906)	(77.146)	(87.798)	(26.532)
Creative * Rule	-0.180	-0.139	-0.229	-0.049
	(0.121)	(0.131)	(0.137)	(0.053)
Constant	-132.408	51.826	-332.594	207.927
	(599.407)	(195.403)	(963.108)	(556.376)
Cantonal FE	YES	YES	YES	YES
R-Squared	30.080	25.120	22.940	-
F-stat / Chi2	3.350	1.750	534.310	1255.480
p-value	0.000	0.048	0.000	0.000
N	170	145	169	167

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Simultaneous equations model

Table 14 below reports results from the simultaneous equations model explaining the level of **the balance of the statement of financial performance** as a whole. Whereas not all explanatory variables are individually significant, the joint statistic (F-statistics) indicates that the coefficients are jointly significantly different from zero. Some independent variables are indeed strongly statistically significant.

In the light of the results presented earlier, it appears that the variable "ADC(-1)" significantly influences both operating revenues and operating expenses, and its respective coefficients have the expected sign, i.e. supporting the future tax burden and restricting the future operating expenses. These results confirm our expectations. We can confirm that additional depreciation charges improve governments' financial performance by generating higher tax revenues and by lowering the level of operating expenses. Nonetheless, the effect of creative accounting is quantitatively slightly more pronounced on operating expenses than on operating revenues. Indeed, 1 additional CHF per capita booked as additional depreciation charges tends to allow future operating revenues to be 0.26 CHF per capita higher and simultaneously to restrict future operating expenses by 0.30 CHF per capita. The combined effect of accounting gimmicks on operating revenues and on operating expenses improves future balances of the statement of financial performance by about 0.56 CHF per capita. This impact is slightly larger compared to the one obtained from the single equation model. Nevertheless, greater attention should be paid to the results ensuing from this second model since it disentangles the respective effect of creative accounting on operating revenues and expenses.

As for the impact of special funds ("SF(-1)") on governments' financial performance, results seem to be in line with those obtained through the direct estimation of the balance of the statement of financial performance. Although coefficients boast the expected signs, the variable is not statistically significant regarding the operating expenses equation and it is only statistically significant at the 90% level for the operating revenues equation. Considering the results obtained from the single equation model, operations involving cookie-jar reserves appear to have no impact on the governments financial performance.

Table 14: Results of the simultaneous equations model

	Revenue	Expense
ADC(-1)	0.266***	-0.304***
	(0.067)	(0.069)
SF(-1)	0.112*	-0.013
	(0.065)	(0.072)
Revenue(-1)	0.373***	
	(0.040)	
Expense(-1)		0.522***
		(0.056)
Revenue		0.360***
		(0.063)
Expense	0.618***	
	(0.050)	
Error		-0.515***
		(0.137)
Growth	27.493***	-17.541*
	(9.083)	(9.833)
Unemployment	-26.374*	67.541***
	(13.709)	(13.586)
Elderly	-4.806	62.782***
	(18.289)	(18.971)
Government	-147.97***	119.119**
	(44.341)	(47.662)
Coalition	18.402	56.417
	(34.813)	(37.068)
Concordance	21.595	-250.309*
	(122.043)	(129.721)
Departments	0.799	1.041
	(12.057)	(12.852)
Election	-11.550	11.697
	(31.710)	(33.733)
Initiative	92.434	-151.457
	(141.795)	(149.935)
Referendum	-6.574	53.320
	(59.630)	(63.453)
Rule	37.732	33.108
	(47.061)	(50.506)
Creative * Rule	0.007	0.047
	(0.048)	(0.051)
Constant	536.752	-343.582
	(634.592)	(674.910)
Cantonal FE	YES	YES
R-Squared	0.987	0.986
F-statistics	56538.070	50496.31
p-value	0.000	0.000
N	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

And again, the cumulative effect of both creative accounting operations and fiscal rule ("Creative * Rule") has no significant influence on operating revenues or on operating expenses. This result goes against our hypothesis.

However, some control variables included in the model still reveal significant influences on operating revenues and operating expenses. Besides, results strongly corroborate the ones obtained thanks to the single equation model. Nonetheless, as it has been formulated above, a simultaneous equations model is particularly relevant when studying the explanation of public balances as operating revenues ("Revenue") and operating expenses ("Expenses") simultaneously influence each other. Such an effect is verified in the light of our results. Indeed, both variables are strongly significant and have a positive coefficient. The influence of operating expenses on operating revenues is stronger than the inverse phenomenon suggesting that the level of revenues to be collected mainly depends on the public services provided. Then, by looking at the lagged dependent variables ("Revenue(-1)" and "Expenses(-1)"), strong evidence is provided as to the practice of incremental budgeting in Swiss cantons during the budgeting process. Indeed, their respective coefficient is statistically significant and shows a positive sign. Therefore, 1 CHF per capita of operating revenues or operating expenses reported in year *t-1* will increase the operating revenues and the operating expenses in the subsequent year by about 0.37 CHF per capita and 0.52 CHF per capita respectively.

By paying attention to the operating expenses equation, it is shown that the coefficient associated to the variable "Error" is strongly significant and has a negative value. In other words, the underestimation of tax revenues lowers the balances of the statement of financial performance through a reduction of operating expenses. Indeed, when tax revenues are underestimated by 1 CHF per capita, it ensues an operating expenses reduction of about 0.51 CHF per capita. Moreover, the cantonal unemployment rate ("Unemployment") also has a significant negative influence on the balance of the statement of financial performance since it decreases operating revenues and increases operating expenses at the same time. Nonetheless, the impact of the unemployment rate on governments financial performance is mainly due to higher operating expenses. The operating expenses equation reveals a more significant and higher coefficient. Conversely, the economic growth rate ("Growth") improves the balance of

the statement of financial performance through higher operating revenues mainly. Finally, consistent with results obtained with the previous estimation strategy, more right-wing governments are associated with lower financial performance as they tend to simultaneously increase operating expenses and decrease operating revenues.

Further, Table 15 below reports results ensuing from the simultaneous equations model in **cases of surpluses** (i.e. when "Revenue" is larger than "Expense"). The results presented in the following table show that the parameter associated to the variable "ADC(-1)" has a positive sign in the "Revenue" equation and a negative sign in the "Expense" equation, respectively. Moreover, in both equations, the variable "ADC(-1)" is strongly statistically significant. Consequently, additional depreciation charges improve surpluses by simultaneously generating higher revenues and by putting expenses under pressure. Whereas 1 CHF per capita reported as additional depreciation in year *t-1* engenders future additional revenues of about 0.20 CHF per capita, future expenses are lowered by an amount of 0.24 CHF per capita. However, the influence of special funds on future surpluses is less clear. Strangely enough, the respective coefficients of the variable SF(-1) are positive in both "Revenue" and "Expense" equations, suggesting that operations on special funds increase both operating revenues and operating expenses in cases of public surpluses. Nonetheless, the variable "SF(-1)" is only statistically significant (at the 95% level) in the revenue equation. That way, a net allocation of 1 CHF per capita would improve future public surpluses through an increase of revenues by about 0.11 CHF per capita.

Table 15 below also reports results of the simultaneous equations models in **cases of deficits** (i.e. when "Revenue" is smaller than "Expense"). In such circumstances, the variable "ADC(-1)" does not have any statistical influence on operating revenues or on operating expenses. Though, its coefficient has the expected sign. A similar conclusion may be formulated as to the influence of the variable "SF(-1)". Moreover, these results are consistent to those obtained through the various single equation models.

Table 15: Results of the simultaneous equations model in cases of surpluses and deficits

	Surpluses		Deficits	
	Revenue	Expense	Revenue	Expenses
ADC(-1)	0.203***	-0.247***	0.166	-0.160
	(0.058)	(0.058)	(0.176)	(0.172)
SF(-1)	0.119**	0.009	0.341	-0.419*
	(0.052)	(0.060)	(0.305)	(0.231)
Revenue(-1)	0.207***		0.131	
	(0.035)		(0.183)	
Expense(-1)		0.390***		0.089
		(0.063)		(0.094)
Revenue		0.473***		0.925***
		(0.075)		(0.096)
Expense	0.832***		0.851***	
	(0.045)		(0.193)	
Error		-0.514***		-0.070
		(0.134)		(0.122)
Growth	19.474**	-14.932	16.667	-13.670
	(8.787)	(9.164)	(14.855)	(14.559)
Unemployment	-32.411*	82.033***	-31.634*	39.866***
	(18.206)	(17.503)	(17.177)	(14.949)
Elderly	-7.618	69.508***	12.501	-23.343
	(17.614)	(18.862)	(34.145)	(33.589)
Government	-105.054**	152.618***	-78.064	56.496
	(50.645)	(51.622)	(61.920)	(65.710)
Coalition	-30.184	55.808	24.591	-5.870
	(35.565)	(36.391)	(61.170)	(58.478)
Concordance	58.375	-266.363**	-222.540	250.234
	(112.708)	(118.575)	(302.121)	(296.938)
Departments	-4.800	11.789	3.764	-4.409
	(14.005)	(14.549)	(15.876)	(14.825)
Election	34.359	-17.915	-39.666	33.727
	(31.431)	(32.499)	(44.184)	(43.106)
Initiative	145.106	-179.634	7.569	89.592
	(128.341)	(132.509)	(348.784)	(322.324)
Referendum	-58.703	58.582	139.170	-155.453
	(56.539)	(58.469)	(119.471)	(118.419)
Rule	43.523	39.791	-111.571	67.334
	(51.883)	(56.152)	(81.694)	(73.557)
Creative * Rule	0.001	-0.052	0.004	0.004
	(0.040)	(0.043)	(0.133)	(0.126)
Constant	404.570	-650.492	-308.858	161.680
	(648.711)	(673.355)	(1216.228)	(1181.731)
Cantonal FE	YES	YES	YES	YES
R-Squared	99.340	99.280	99.020	99.000
F-stat / Chi2	69993.020	62221.830	22649.080	26775.780
p-value	0.000	0.000	0.000	0.000
N	449	449	254	254

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Hence, it is by ensuring larger surpluses that creative accounting operations (and above all additional depreciation charges) improve government's financial performance over time since they do not put public deficits under pressure.

8.5 Robustness checks

In order to ensure the validity of the results obtained thanks to the different models (i.e. the single and the simultaneous equations models) and the different estimators (i.e. OLS, REGAR, PCSE, 2SLS, GMM and 3SLS), we also performed several robustness checks.

Explanation of public surpluses and deficits through the Tobit estimation

Throughout this research, we have investigated whether the improvement of governments' financial performance is due to larger surpluses, smaller deficits or to a combination of both phenomenons. This was done by replacing the dependent variable "Balance" either by "Surplus" when operating revenues are larger than operating expenses (Balance > 0) or by "Deficit" otherwise (Balance < 0). However, variables "Surplus" and "Deficit" have the particularity of being censored at 0. Whereas the variable "Surplus" only contains positive values, the inverse occurs with the variable "Deficit". In such circumstances, linear regressions (e.g. with the OLS estimator) might lead to inconsistent estimates. In order to cope with this issue, it is recommended to use the Tobit estimator, which is appropriate when the dependent variable is observed over some interval of its support (Tobin 1958). Table 39 in Appendix P reports results of the estimation of public surpluses ("Surplus") and deficits ("Deficits") with the Tobit estimator.

When considering the impact of creative accounting on public surpluses, results obtained through the Tobit estimator are consistent with those ensuing from initial linear regression models (OLS, REGAR, 2SLS and GMM). The parameter associated to the variable "ADC(-1)" points out a positive sign and is strongly statistically significant at the 99% level. In comparison to other estimation strategies, this confirms that additional depreciation charges

improve governments' financial performance over time by ensuring larger surpluses. However it is not the case of special funds. The variable "SF(-1)" is not statistically significant even if its coefficient has a positive sign.

The picture provided by the Tobit estimator as to the explanation of public deficits is somewhat different to results initially obtained. Here, the variable "ADC(-1)" appears to be statistically significant at the 95% level and is associated to a positive coefficient. In light of these results, it seems that additional depreciation charges reduce public deficits over time. As to the variable "SF(-1)", it does not seem to significantly put public deficits under pressure even though its coefficient is also positive.

In spite of the fact additional depreciation charges have been shown to alleviate future public deficits with the Tobit estimator, this result should be interpreted with caution. Similar results were not obtained in the single equation models nor in the simultaneous equations model . The variable "ADC(-1)" never turns out to be strongly statistically significant through initial estimation strategies.

Influence of creative accounting on revenues and expenses

During interviews, experts or civil servants mainly expressed the fact that creative accounting should improve the governments' financial performance by principally putting expenses under pressure. Indeed, only few of them argued that creative accounting could generate additional revenues. Thence, in order to ensure the consistency of the results obtained through the simultaneous equations model, we also re-estimated it by only including "ADC(-1)" and "SF(-1)" in the "Expense" equation. To check, we also ran the simultaneous equations model by incorporating the variables of interests in the "Revenue" equation only.

When looking at the "Expense" equation reported in Table 40 in Appendix P, results are consistent with the original simultaneous equations model. Indeed, whereas the variable "SF(-1)" does not show any statistical significance, the parameter associated to "ADC(-1)" is positive and strongly significant. However, the coefficient is slightly smaller (-0.256) compared to the original model (-0.304). Similar evidence is also provided when only "ADC(-1)" and "SF(-1)" are included in the "Revenue" equation (see Table 41 in Appendix P). The variable

"ADC(-1)" reveals a positive and significant coefficient, highlighting the fact that additional depreciation charges effectively generate additional revenues in the future. Nonetheless, the coefficient obtained through the original simultaneous equations model is sensitively larger (0.266) than the one ensuing from the robustness check (0.208). As to the influence of special funds on revenues, the coefficient of the variable "SF(-1)" obtained through the robustness check is comparable to the one obtained in the original model. Moreover, in both cases, the coefficient reveals almost no statistical significance (90% level only).

Suspicion of multicollinearity between the variables of interest and "Error"

Since an underestimation of tax revenues during the budgeting process could engender the resort to additional depreciation charges or particularly large allocations to special funds, our variables of interest may be suspected to be collinear with the variable "Error". However, ADC(-1) and SF(-1) are based on year *t-1*, whereas "Error relies on year *t*. Collinearity should thus not be an issue as revealed in Table 16 below. Despite everything and in order to ensure the robustness of the initial results, models are re-estimated after having excluded "Error" from the set of control variables.

Table 16: Detection of multicollinearity between the variables of interest and "Error"

Variables	VIF	1/VIF
Error	1.00	1.00
ADC(-1)	1.01	1.00
SF(-1)	1.01	1.00
Mean VIF	1.01	

Multicolinearity may be an issue when the VIF is equal to or higher than 10.

When analyzing the single equation model, the exclusion of "Error" does not appear to alter initial results as reported in Table 42 in Appendix P. In addition to remain strongly significant, the variable "ADC(-1)" presents almost comparable coefficients than initially even if they are slightly larger when estimated through OLS, REGAR and 2SLS or slightly smaller when estimated through PCSE and GMM. Then, no significant change is noticed regarding other variables.

However, the picture is very different when "Error" is excluded from the simultaneous

equations model as demonstrated in Table 43 in Appendix P. Notably, "ADC(-1)" looses its significance in the "Revenue" equation whereas it keeps it in the "Expense" equation. This loss of significance seems to be offset by "Revenue(-1)" that shows a coefficient twice as large as it was in the initial model. Similarly, "Revenue" is also associated with a larger coefficient when it explains "Expense".

The variable "Growth" is also affected by the exclusion of "Error" since its parameter becomes negative and insignificant in the equation devoted to "Revenue". Moreover, whereas "Unemployment" was associated to a negative and almost insignificant parameter in the initial model, the variable shows a large positive and significant coefficient in the revisited model. Nonetheless, the fact that higher unemployment rates generate additional revenues is difficulty justifiable from a pure economic perspective. Similar considerations may also be drawn regarding the variable "Elderly". Finally, "Coalition" and "Concordance" turn out to be strongly significant after the exclusion of "Error".

As collinearity was not revealed between the variables of interest and, in the light of the results obtained from the robustness check, it does not appear relevant to exclude "Error" from the set of control variables.

Exclusion of insignificant control variables

It also appears relevant to control whether main results are affected by the exclusion of insignificant variables. More particularly, we are interested in making sure that the coefficient and the significance of our variables of interest ("ADC(-1)" and "SF(-1)") remain stable when insignificant control variables are dropped. As demonstrated in Table 44 in Appendix P, "ADC(-1)" remains strongly significant at the 99% level in the single equation model. Its associated coefficient is nonetheless revealed as being slightly larger. For instance, the coefficient estimated through OLS points out a value of 0.315 for the initial model and a value of 0.327 for the model not including insignificant control variables. The variable "ADC(-1)" does not appear affected by the exclusion of insignificant control variables in the simultaneous equations model (see Table 45 in Appendix P). Only its coefficient in the "Expense" equation is slightly smaller revealing a value of -0.304 in the initial model instead of a value equal to

-0.262 in the model excluding insignificant control variables. Finally, the variable "SF(-1)" never turns out to be significant whereas the set of control variables is substantially reduced.

Exclusion of some particular cantons

As discussed in the section devoted to the data, the canton of Uri (UR) registers particularly high amounts of additional depreciation charges compared to other cantons. Therefore, in order to check the robustness of our results, we have excluded the canton of Uri from our data set and have re-estimated various models.[90] Table 46 and Table 47 in Appendix P reveal that our results are strongly robust. The parameter associated to our variable of interest ("ADC(-1)") is consistent with former results and the variable remains strongly significant. The same is true when we look at control variables.

Evidence also supports the idea that the canton of Geneva (GE) turns out to be much more spendthrift than other Swiss cantons. Indeed over the considered period, its average deficit is much larger than anywhere else. This particular case could thence be suspected of influencing our results. That is why we re-estimated the various models by excluding the canton of Geneva from the data set. Results ensuing from this new estimation strategy provide consistent results with those initially obtained, as shown in tables 48 and 49 in Appendix P. However the coefficient of the variable "ADC(-1)" is slightly larger when the canton of Geneva is excluded from the data, independently from the considered estimator.

Furthermore, with regard to their particular use of creative accounting, it appeared relevant to re-estimate models without the cantons of Jura (JU) and Aargau (AG). As revealed in Section 6, the canton of Jura (JU) has reported an average surplus over the considered period whereas, in reality, its balance was negative. As to the canton of Aargau (AG), its reported average surplus is larger than its true and fair representation. Such a use of creative accounting is relatively surprising since Swiss cantons were expected to hide surpluses instead of embellishing reality. Two different models were re-estimated, each of them excluding either the canton of Jura (JU) or Aargau (AG). In light of the results presented in tables 50 and 51 in Appendix P, the exclusion of the canton of Jura (JU) does not affect the results initially

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[90]Another possibility would have been to include a dummy for each particular canton. Nonetheless, this solution does not appear relevant since cantonal fixed effects are already included in the various models to be tested.

obtained. However, the models performed without the canton of Aargau bring out the fact that the coefficient associated to the variable "ADC(-1)" is smaller than in the initial model (see Table 52 and Table 53 in Appendix P). When considering results obtained through the OLS estimator, the value of the coefficient is 0.315 in the initial model and it is about 0.306 when the panel does not include the canton of Aargau.

Inclusion of time fixed effects

Moreover, although there are economic justifications to include variables "Growth" and "Unemployment" in the initial model, we also suggest that both variables could account for time fixed effects. This is among other things the reason why time fixed effects are not included in initial models devoted to the explanation of public deficits. By consequent, in order to validate our first estimation strategy, we have re-estimated models by including time fixed effects instead of variables "Growth" and "Unemployment". According to the results reported in tables 54 and 55, the coefficient associated to the variable "ADC(-1)" appears to be sensitively smaller than usual. Nevertheless, our variable of interest remains statistically significant at the 99% level. Moreover, usual significant control variables also keep their expected sign and do not lose their statistical significance when time fixed effects are included in the models. This new robustness check supports the results obtained in initial specifications.

Shorter time series

The last robustness check consisted in re-estimating models on a shorter time period. As Swiss cantons did not implemented the HAM1 the same year, the panel is strongly unbalanced. Besides, even if it should not have been the case, it cannot be ruled out that some cantons chose the year of implementation for strategical reasons. In order to alleviate the potential influence of the unbalanced panel, we ran both models on a shorter period going from 1997 to 2012, i.e. the canton of St-Gallen (SG) was the latest canton to have implemented the HAM1, in 1997. As it was the case in other robustness checks, results appear to be consistent with those initially obtained although, as reported in tables 56 and 57 in Appendix P, variables generally point out smaller coefficients.

8.6 Summary and discussion of the results

The econometric results, based on several estimators and assessed through several robustness checks, prove to be robust and thus reliable. They confirm that creative accounting relying on additional depreciation charges significantly and positively affect the future level of operating revenues, whereas they negatively affect the level of future operating expenses; with the magnitude of the former impact being slightly smaller than the one of the latter. Consequently this trick produces a positive and structural impact on the future balance. Depending on which model is considered - single or simultaneous - 1 CHF per capita of additional depreciation improves the balance of the coming fiscal year by about 0.30 to 0.50 CHF per capita. As for the special funds (i.e. the net allocation to cookie-jar reserves), the trick has no significant impact on the operating revenues, nor on the operating expenses, nor on the balance. Consequently, the use of special funds does not appear to structurally improve the future governments' financial performance. Instead, we can reasonably assume that special funds account for a device allowing to smooth the statement of financial performance in the short run, i.e. to absorb the shocks of the business cycle. For this reason, with or without special funds, the average financial performance of Swiss cantons would have been unchanged over the considered period since this particular accounting trick does not allow to structurally modify the balance of the statement of financial performance. Besides, this assumption is consistent with the words expressed by some of the experts from cantonal administrations of finance .

Moreover, results have demonstrated that it is exclusively by generating larger surpluses that additional depreciation charges allow to structurally improve government's financial performance. Indeed, creative accounting operations were not revealed to be efficient tools to lower public deficits. Depending on which estimator is considered in the single equation model, 1 CHF per capita recorded as additional depreciation charges increases future surpluses by an amount bounded between 0.22 and 0.33 CHF per capita. Similarly, the simultaneous equations model highlighted the fact that additional depreciation charges increase future surpluses by generating supplementary operating revenues and by putting operating expenses under pressure. The impact of additional depreciation charges on operating ex-

penses is slightly stronger (0.24 CHF per capita) than their impact on operating revenues (0.20 CHF per capita).

Nevertheless, in spite of the above mentioned considerations, results provide food for thought regarding the finance ministers' behavior as to the public sector financial management. Whereas it is almost exclusively debated in the literature that creative accounting is used to hide public deficits, we provide evidence that such practices are also embraced in order to conceal good news. As supported by Dafflon and Rossi (1999), *"since the political decision-makers are always afraid to be forced to take unpopular budgetary measures [when they face fiscal distress] (which ultimately might threaten their own individual goals), creative accounting may represent a good instrument of the last resort to avert such decisions"*. Indeed, as discussed in Section 3, the finance ministers' chances of reelection heavily rely on their capacity to ensure fiscal soundness. Therefore, instead of facing the risk of not being reelected, resorting to creative accounting may appear more convenient than resolving the structural financial problems. However, in our particular case, we may argue that finance ministers enlist in a sort of "preventive" creative accounting. By ensuring a structural surplus through the use of accounting gimmicks, they try to make sure they will not have to implement measures (i.e. tax increases and/or spending cuts) that could damage their reelection chances. Interestingly enough, either they try to sweep the dust under the rug or to dissimulate good news, finance ministers resort to creative accounting in the sole purpose of maximizing their own utility, namely increasing the probability of remaining in position during the coming legislature.

Moreover, this research offers interesting political implications. First, additional depreciation charges appear to be an asymmetric mechanism that allows the government and the finance minister to maximize the cash flow from operating activities over time. This finding is in line with existing research dealing with public sector financial management. Chatagny and Soguel (2012b) show that cantonal finance ministers tend to engage in strategic budgeting by largely underestimating tax revenues during the budgeting process. This underestimation also restrains the level of operating expenses and ends up by improving public balances. Nevertheless, we assume that the underestimation of tax revenues needs then strategic and

asymmetric reporting like additional depreciation to become fully effective. Indeed collecting more tax revenues than budgeted represents a pleasant surprise, which could wet spending ministers' appetites either for increased spending or for tax cuts. As a consequence, additional depreciation charges (or similar creative accounting operations) would be required in order to avoid such political claims as demonstrated by Rose and Smith (2012).

Another implication concerns fiscal rules. Fiscal rules were initially implemented to restrain government deficits and debt (Bohn and Inman 1996; Feld and Kirchgässner 2008; Bodmer 2012). Nevertheless, some authors consider them as ineffective since some governments engage in accounting manipulations to meet the targets set by the rules. Under this interpretation, rules would not be the right device to ensure fiscal soundness. Instead, they appear more as an objective in themselves. Our results point in that direction since the variable controlling for the stringency of the fiscal rules does not show any statistical significance.[91] According to the estimated models, it is not the fiscal rules that allow to cut government deficits or to enhance surplus but the accounting tricks implemented to meet the targets set by the rules. As largely discussed in the literature, this would be particularly true when governments face very binding fiscal rules. For example, Luechinger and Schaltegger (2011) show that such fiscal rules reduce the occurrence of government deficits in Swiss cantons.[92] However they also mention that deficits may have been lowered - at least partially - with the help of creative accounting operations. Now our results provide strong evidence that accounting tricks are one of the most efficient techniques allowing the Swiss cantons to fulfill the fiscal rules requirements.

Our assertion appears all the more obvious since it is partly in line with the one of Wagner and Sobel (2006). Indeed, both authors demonstrate that it is the implementation of rainy

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[91]Methodological reasons might also partly explain the statistical insignificance of the variable "Rule". To various degrees and differently in each canton, fiscal rules are expected to regulate the level of public spending and public revenues. But as demonstrated in the simultaneous equations model, the variable "Rule" is included as a determinant of "Revenue" and "Expense", whereas "Revenue" and "Expense" are explanatory endogenous variables. Consequently, we cannot rule out that the influence of "Rule" be (at least marginally) captured by "Revenue" ("Expense") in the explanation of "Expense" ("Revenue").

[92]The model tested in this research is different to the one of Luechinger and Schaltegger (2011). Indeed, whereas they investigate whether fiscal rules affect the occurrence of public deficits in Swiss cantons, we question the influence of such fiscal rules on the level of public deficits over time. Not following the same approach as the one initially proposed by Luechinger and Schaltegger (2011), this might therefore partly explain the results ensuing from our research.

day funds that have allowed US States to reach targets fixed by budget rules. That way, it would seem that those targets could not be achieved by simply adjusting public revenues and public spending. There is every reason to believe that the legal framework does not provide enough flexibility to do so. Consequently, since governments (and thus Swiss cantons) cannot play with "common" public revenues and public spending to reach the target fixed by budget rules, they need alternative solutions. Whereas some governments (EU countries) resort to "corrective" creative accounting to artificially conceal public deficits, some others (US States) use legal devices like rainy day funds to do so. Then, in Switzerland, the alternative solution embraced by cantons can be assimilated to a sort of "preventive" creative accounting performed through the use of additional depreciation charges. Regardless to the solution used, strong evidence supports the idea that the constraints fixed by budget rules do not appear achievable by themselves. In other words, it is as if a step was missing between the objective to be reached and its fulfillment. And so, it may reasonably be asserted that to be effective, budget rules should be systematically accompanied by a legal measure allowing to achieve its targets.

A further policy implication should be drawn in conjunction with the implementation of more stringent international accounting standards for the public sector, like the IPSAS. The main objective of the IPSAS is to guarantee the transparency of governments' financial statements. In other words, if fully applied, these standards should provide a true and fair view of government financial performance and position. Consequently, the IPSAS should act as a barrier against the creative accounting by forbidding tricks. The acknowledged final aim is to facilitate the decision-making process and to give way to policy makers taking better decisions. Of course this aim is legitimate, notably in case governments are facing an unsustainable financial situation. However, this position must be considered with critical distance, as shown by the case of the Swiss cantons. In this particular case, creative accounting operations, and specifically additional depreciation charges, represent an elbow room to ensure structural surpluses, but also to prevent structural deficits.

Without this accounting trick the financial situation of the Swiss cantons could not have been as sound as it is now. In the case of accounting standards ruling out the possibility of

using accounting tricks, the structural surplus would be truly and fairly reported. If this was the case, perhaps tax cuts or spending increases would have been claimed for possibly with threatening consequences on the fiscal sustainability. Moreover, without a structural surplus obtained partially through such gimmicks, governments could have strong incentives to resort to drastic tax increases and/or spending cuts in order to reach the financial equilibrium. In such cases, the provision of public services over time would be precarious. The latter demonstration strongly suggests the existence of a tradeoff between fiscal soundness and a true and fair financial reporting in the public sector.

Nonetheless, in spite of the undeniable need to safeguard a reasonable degree of transparency, it can be reasonably supported that creative accounting is a lesser evil since it allows to ensure fiscal soundness and therefore a constant provision of public services on the long run. Our recommendation in order to cope with the above mentioned tradeoff, is to give formal legal force to loopholes such as additional depreciation charges since their capacity to avoid a structural deficit has been demonstrated.

9 Quantitative impact of finance ministers' personal characteristics on the use of creative accounting

In this section, we introduce the model covering the determinants of creative accounting operations recorded in Swiss cantons. First, we present the set of variables we use in the research. We then present the three econometric models we use to test the previously formulated hypothesis. Indeed, we resort to three complementary estimation strategies: (1) we tackle the determinants of the creative accounting operations level through linear regression models, (2) we also investigate the determinants of the creative accounting operations level through a Tobit regression model since the dependent variable is censored at 0 and (3) we tackle the probability that the use of creative accounting occurs through logistic regression models. The respective econometric estimators for each model are also presented. Finally, we present and discuss the results.

Before going further, preliminary remarks are necessary. Although we are interested in highlighting the finance ministers' personal characteristics that matter for the resort to creative accounting, we also want to provide glimpses as to those personal characteristics that indirectly and structurally influence the governments' financial performance. As the use of creative accounting (at least additional depreciation charges) structurally impacts governments' financial performance, finance ministers resorting the most largely to accounting gimmicks are also those who structurally influence the cantonal financial situation. Indeed, it is not directly but through the policies they implement that finance ministers structurally impact the balance of the statement of financial performance. Consequently, as special funds do not structurally influence the governments' financial performance, the current section is only devoted to the role played by finance ministers in the record of additional depreciation charges during the reporting process.

9.1 Variables[93]

Dependent variables

Depending on the estimation strategy we perform, two different dependent variables are considered. The variable "ADC" is used for the first and second estimation strategy. As for the explanation of public deficits, "ADC" accounts for the total amount of additional depreciation charges recorded in reported figures and is expressed in real terms per capita. We also have to bear in mind that the use of additional depreciation charges is asymmetric. In other words, this trick may only be used to hide surpluses by artificially increasing operating expenses. Swiss cantons can thus only embrace two choices when a surplus occurs during the reporting process: resorting to additional depreciation charges or not. For the second estimation strategy, we use the variable "ADCbinary" which highlights whether or not a Swiss canton resorts to such a practice and has the value 1 when a Swiss canton uses additional depreciation charges and 0 otherwise.

Variables of interest

As discussed in subsection 4.3, the variables that are the object of our attention are as follows:

"Balance" is the cantonal corrected balance of the statement of financial performance as defined in subsection 6.3. As a reminder, "Balance" may be either positive in cases of surpluses ("Surplus") or negative otherwise ("Deficit"). The variable is expressed in real term per capita. As already argued, larger corrected balances should be associated with larger amounts of additional depreciation charges or a larger probability they will be used, since finance ministers may want to avoid political pressure aiming at reducing tax rates and/or at increasing public spending.

"Ideology" refers to the finance ministers political leaning. In this research, we expect that left-wing finance ministers should be associated with higher amounts of additional depreciation charges. To operationalize the variable, we use the political ideology scale proposed by

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[93]Table 17 below reports summary statistics for variables used in the various models dealing with the determinants of creative accounting.

Ladner (2006), which assigns a value to each political party. This scale is bounded between 0 and 10; 0 being the far left and 10 the far right wing.

"Experience" captures the finance ministers political experience. As hypothesized, more experienced finance ministers should resort to creative accounting operations more actively since they should be more capable to create information asymmetry between themselves, on one hand, and other stakeholders (spending ministers, deputies, citizens and media) on the other hand. The variable measures the finance ministers' tenure on a monthly basis and is incrementally operationalized, i.e. the time in position increases year after year.

"Education" is the set of variables capturing the finance ministers' educational background. While we focus on finance ministers having a university degree in economics ("Economics") and expect these ministers to be associated with larger amounts of creative accounting or a larger probability to resort to it, we also control for other trainings. We take into account finance ministers having done an apprenticeship ("Apprenticeship") or that have a university degree in political sciences ("Politics") or in law ("Law") or any other university degree ("Other"). These five variables are dummy variables taking the value 1 regarding the finance ministers' educational background and the value 0 otherwise.

Control variables

In order to isolate the effect of our variables of interest, we also control for other variables' influence on additional depreciation charges. For each control variable, we mention how the variable is compiled, its own expected effect on additional depreciation charges and the source of the information we used. The control variables introduced in the model are as follows:

"Error" reflects the tax revenue budgeting errors. Here we assume that in a situation where reported tax revenues are higher than initially forecasted, finance ministers may have strong incentives to hide the *good news* by resorting to creative accounting operations. A larger underestimation of tax revenues should therefore be associated with higher amounts of additional depreciation charges. Lastly, the variable is expressed in real terms per capita.

"Rule" captures the stringency of cantonal budget constraints. According to Milesi-

Ferretti (2004), fiscal rules may provide the incentive for creative accounting. Moreover, as mentioned by Drazen (2002) and Von Hagen and Wolff (2006), more binding fiscal rules are generally associated to harder accounting gimmicks. Following both assertions, we assume that Swiss cantons having to deal with more stringent fiscal rules will resort to creative accounting more widely and more frequently. Using the operationalization proposed by Luechinger and Schaltegger (2011), the variable presents as follows: cantons having the most stringent fiscal rules take the value 3, the value 2 corresponds to fairly stringent rules, the value 1 is for the least stringent rules and 0 otherwise.

"Election" refers to years where cantonal government are elected. Since it is strongly tenable that finance ministers are assessed by voters on their capacity to ensure fiscal soundness, they have a vested interest to report - high - surpluses when an election occurs in order to increase the reelection chances. Consequently, we expect that the resort to creative accounting is lower during election years. The effect of elections on creative accounting operations is captured by a dummy variable taking the value of 1 during election years and 0 otherwise.[94]

"Concordance" reflects the solidarity between the executive and the legislative powers. According to Roubini and Sachs (1989) and Volkerink and De Haan (2001), if there is no concordance between both powers, they will probably face difficulties to reach agreements. Both bodies having different interests in such a situation, finance ministers would have even more incentives to hide public surpluses through accounting gimmicks in order to reach their own targets. As a consequence, the lower the concordance between the government and the parliament, the higher the resort to creative accounting by finance ministers should be. Finally, the variable is measured by the proportion of government parties represented in the parliament.[95]

"Coalition" is the political fragmentation of cantonal governments. As also revealed by Roubini and Sachs (1989) and more recently by Volkerink and De Haan (2001), such a fragmentation is associated with higher public deficits. We may thus reasonably expect that finance ministers performing in such a context would tend to resort to creative accounting more largely in order to ensure fiscal soundness. In other words, the larger the political

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[94]Source: Année politique suisse, BADAC and Swiss Federal Statistics Office (SFSO).
[95]Source: Swiss Federal Statistics Office (SFSO).

fragmentation of the government, the higher the amounts of creative accounting should be. The indicator capturing the political fragmentation measures the number of parties in a cantonal government.[96]

"Age" measures the finance ministers' age during the period they are in position.

"Gender" indicates the finance ministers' gender. The variable takes the value 1 when the finance minister is female and the value 0 otherwise.

9.2 Potential endogeneous covariates

Endogeneity may be an important issue as it may cause the estimated parameters to be both biased and inconsistent. We therefore question whether some endogeneous covariates are present in models to be estimated in this subsection.

One must first tackle whether the selection of politicians gives rise to potential endogoneity. Indeed, since ministers in Swiss cantons are elected through the direct universal suffrage, i.e. directly by citizens, one could argue that the ministers' personal characteristics are determined by citizens preferences. Despite everything, here we argue that our model is not affected by endogeneity. First of all, the idea that creative accounting operations have a reverse causal effect on citizens voting behavior (or on the finance ministers personal characteristics) does not appear realistic. Although in the Swiss context most of the creative accounting operations are transparent and reported in public figures (at least additional depreciation charges), they do not receive attention from the public and especially from the media. It is mainly the balance of the statement of financial performance that is the subject of such attention. Secondly, while politicians are elected through the direct universal suffrage, citizens do not have any influence on which ministry will be assigned to which elected politician. It is quite the contrary since the allocation of the ministries is carried out after the election and is monitored by implicit rules (e.g. years in office, political experience, etc.). Hence, the allocation of ministries mainly ensues from a bargain between elected politicians.

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[96]Source: Année politique suisse

Table 17: Summary statistics

Variables	Definition / Unit of measurement	Source	Mean	Std. dev.	Min	Max	N
Error	direct tax revenue budgeting error in real CHF per capita	Cantonal financial accounts	-88.038	230.017	-2'150.996	1'231.055	858
Rule	Stringency of cantonal budget rules	Lueschinger & Schaltegger (2012)	0.515	0.949	0.000	3.000	858
Election	dummy taking the value 1 in election years	APS	0.261	0.439	0.000	1.000	858
Coalition	number of political parties in the government cabinet	BADAC / APS	3.432	0.911	1.000	5.000	858
Concordance	percentage of the seats in the parliament that are occupied by members of parties represented in the government	APS	0.837	0.141	0.000	1.000	858
Age	age of the cantonal finance ministers	Own data	52.305	6.778	32.000	69.000	858
Gender	dummy taking the value 1 for female finance ministers	Own data	0.099	0.299	0.000	1.000	858
Balance	SPER-balance in real CHF per capita	Cantonal financial accounts	129.777	533.207	-3'158.800	2'376.233	729
Surplus	Balance > 0; in real CHF per capita	Cantonal financial accounts	384.615	402.320	1.080	2'376.230	470
Deficit	Balance < 0; in real CHF per capita	Cantonal financial accounts	-332.670	418.341	-3'158.800	-1.680	259
Ideology	political ideology of the cantonal finance ministers	FKF	5.956	1.348	2.600	7.700	858
Experience	number of months in position	Own data	77.960	47.399	7.500	219.000	858
Apprenticeship	dummy taking the value 1 for apprenticeship background	Own data	0.270	0.444	0.000	1.000	858
Economics	dummy taking the value 1 for a background in economics	Own data	0.198	0.399	0.000	1.000	858
Law	dummy taking the value 1 for a background in law	Own data	0.406	0.491	0.000	1.000	858
Politics	dummy taking the value 1 for a background in politics	Own data	0.029	0.168	0.000	1.000	858

Année Politique Suisse (APS), Database on Swiss cantons and Towns (BADAC), Fachgruppe für Kantonale Finanzfragen (FKF), Swiss Federal Statistical Office (SFSO)

Finally, as argued by Dreher et al. (2009), *"profession and education of politicians is almost idiosyncratic. While politicians with different profession and education pursue different policies, voters can usually choose between few candidates running for office only. They can thus not freely select a candidate with a certain profession and education, but only between profession and education of few opponents"*. Consequently, reverse causality should not be an issue in this particular case.

Then, as demonstrated in the previous section, additional depreciation charges reported in year *t-1* ("ADC(-1)") significantly impact the corrected balance of the statement of financial performance ("Balance") reported in year *t*. Then, since we have formulated the hypothesis that the corrected balance of the statement of financial performance determines the level of additional depreciation charges, a reverse causal effect between the variables "Balance" and "ADC" could be suspected. Nevertheless, while the past ("ADC(-1)") affects the future ("Balance") as brought out in the first empirical research, the inverse effect is unlikely to occur. Despite this argumentation, we want to make sure the variable "Balance" is not endogenous in the current model. Following the Hausman test procedure for endogeneity, results highlight the variable "Balance" as being exogenous. There is therefore no need to instrumentalize the variable "Balance". The procedure and the results of the Hausman test are presented in Appendix Q.

9.3 Estimation strategies

In the current subsection, we present the various estimation strategies employed in order to solve the second research question. We start by presenting the linear regression models and then the Tobit and logistic regression models. Nevertheless, particular attention is paid to linear regression models since we are especially interested in knowing the determinants of the amounts recorded as additional depreciation charges.

Linear regression

In order to identify the determinants of the amounts recorded as additional depreciation

charges as well as testing our hypothesis, we first test the following model:

$$ADC_{ijt} = \alpha + \beta Balance_{it} + \delta Ideology_{ijt} + \vartheta Experience_{ijt} + \gamma Education_{ijt}$$
$$+ \theta W_{ijt} + \varphi Z_{it} + \mu_i + \tau_t + \epsilon_{ijt}$$

where $_i$ identifies Swiss cantons, $_j$ identifies finance ministers and $_t$ identifies years. ADC is our measure of additional depreciation charges. α is the constant term. Then, $Balance$ is the variable referring to the corrected balance of the statement of financial performance and β is the associated coefficient measuring the effect on additional depreciation charges. $Ideology$ and $Experience$ respectively measure the finance ministers' political ideology and their tenure. δ and ϑ are the respective associated coefficients. The matrix $Education$ is constituted of variables measuring the finance ministers' educational background as explained above and γ is their associated vector of parameters. Then, W and Z are two matrix of controls. Whereas W reflects finance ministers personal characteristics, Z is constituted by controls at the cantonal level. θ and φ are their respective associated vectors of parameters. Finally, while μ and τ are respectively the cantonal and time fixed effects, ϵ is the error term.

Moreover, as depicted in Subsection 6.3 devoted to descriptive statistics, it appears that the use of creative accounting would differ depending on whether finance ministers have to cope with a surplus or a deficit. To investigate whether finance ministers behave differently according to the financial situation, we re-estimate linear regression models by re-operationalizing the variable "$Balance$" as "$Surplus$" when there is an excess of operating revenues over operating expenses ($Balance > 0$). In the same way, we re-estimate linear regression models by replacing the variable "$Balance$" by "$Deficit$" when operating revenues are smaller than operating expenses ($Balance < 0$).

To ensure the significance and the consistency of our results, some elements must be taken into account. First of all, for different reasons, Swiss cantons are relatively heterogeneous in terms of budget size. Thence, as highlighted by the Breusch-Pagan/Cook-Weisberg test, the

error terms strongly suffer of heteroskedasticity, although the model is expressed per capita.[97] Secondly, serial correlation may also be an issue as most of the variables depend on their past values. While the Wooldridge test for autocorrelation does not reveal the presence of serial correlation of order one, the Arellano-Bond test highlights it but only at the 90% level. Nevertheless, the latter test strongly rejects the the presence of autocorrelation of order two.[98] Thirdly, as cantons are part of the same countries, error terms may be contemporaneously correlated. Fourthly, in the light of the cantons heterogeneity, we include cantonal fixed effects in our models. These fixed effects allow to capture cantonal differences that can hardly be measured or observed in reality.[99] The Hausman test validates our decision to include cantonal fixed effects.[100] At the same time, in order to take into account any time specific effect that is not included in the model, we also include time fixed effects. The Wald test validates the inclusion of such time fixed effects even in the presence of cantonal fixed effects[101]. However, in spite of the inclusion of both cantonal and time fixed effects, multicolinearity is not an issue.[102] Fifthly, it must be noted that our panel is unbalanced as not every Swiss canton had adopted the HAM1 in 1980. Nevertheless, it does not cause any econometric problem since the HAM1 was randomly implemented over time by cantons. In other words, the reasons why we have missing data for some cantons are exogenous. Lastly, one must bear in mind that our panel is based on the 26 Swiss cantons (I = 26) over the period 1980 - 2012 (T = 33); the time series is longer than the cross section. Nevertheless, according to Beck (2004), econometric estimators are better adapted to cases where the inverse occurs.

Given the above mentioned characteristics of our data set, three different econometric

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[97]Results for the Breusch-Pagan/Cook-Weisberg test are presented in Table 61 in Appendix Q.

[98]Results are reported in Table 62 in Appendix Q.

[99]Among those differences, we might think of cultural differences. Although economic aspects are mostly expected to drive the finance ministers' use of additional depreciation charges, we may not rule out that each canton follows its own rules based on its culture. For instance, we may reasonably argue that cantons follow a path dependency concerning their use of specific accounting practices. In other words, the idea that incumbent finance ministers strictly act as their predecessors regarding the resort to additional depreciation charges is defendable. Moreover, it could be ethic reasons that convinced some cantons to not use additional depreciation charges whereas in some others their use is not subjected to debate. It would notably be these ethical and philosophical issues that persuaded some cantons, at least partially, to implement IPSAS norms instead of the HAM1. Cultural aspects being delicate to operationalize, we prefer to include cantonal fixed effects in our model instead.

[100]Results relative to the Hausman test are reported in Table 63 in Appendix Q. Moreover, the inclusion of fixed effects is more relevant than random effects when studying a full population, i.e. the 26 Swiss cantons (Nerlove and Balestra 1996).

[101]Results of the Wald test are presented in Table 64 in Appendix Q.

[102]The Variance Inflation Factor (VIF) is presented in Table 65 in Appendix Q.

estimators are considered. First of all, we use an OLS estimator including cantonal and time fixed effects. Moreover, the error terms are clustered at the cantonal level in order to correct heteroskedasticity and potential autocorrelation within cantons. Then, since we may reasonably expect that error terms are also autocorrelated at the individual level, error terms are also clustered at the finance minister level. Secondly, we consider an estimator proposed by Baltagi and Wu (1999) which fits a cross sectional time series regression model when the error terms are first order correlated (REGAR). This estimator is particularly relevant as it has been especially developed in order to support exogeneously unbalanced panel data and may incorporate cantonal fixed effects. Thirdly, we use the Panel Corrected Standard Errror (PCSE) estimator proposed by Beck and Katz (1995). This estimator has the advantage of correcting heteroskedasticity and contemporaneous correlation. Then, it also allows to deal with first order autocorrelation. Furthermore, the panel does not need to be balanced and the estimator efficiently works when the cross section is smaller than the time series. Consistent with the two other estimation strategies, cantonal and time fixed effects are incorporated when models are estimated through PCSE.

Tobit regression

Since reported amounts of additional depreciation charges cannot be negative, those amounts are by definition bounded between 0 and infinity (at least in theory). Consequently, as observations are censored, linear regressions such as OLS regressions might lead to inconsistent estimates. In such circumstances, the econometric literature recommends to use Tobit models that are relevant when the dependent variable is observed over some interval of its support. Tobit models were first discussed by Tobin (1958).

Through a Tobit estimation, the general model to be estimated is as follows:

$$ADC^*_{ijt} = \alpha_i + \beta X_{ijt} + \epsilon_{ijt}$$

where the latent variable (ADC^*) depends on a vector of regressors (X) and where β is the associated vector of parameters. The idiosyncratic error is represented by ϵ. Finally, $_i$

identifies Swiss cantons, $_j$ identifies finance ministers and $_t$ identifies years.

Moreover, as in our particular case, for the left censoring at L = 0, we observe ADC_{ijt} when

$$ADC_{ijt} = \begin{cases} ADC^*_{ijt} & if \quad ADC^*_{ijt} > 0 \\ 0 & if \quad ADC^*_{ijt} \leq 0 \end{cases}$$

However, as indicated above, error terms suffer of heteroskedasticity and are potentially correlated within individuals (i.e. within Swiss cantons). Both particularities therefore necessitate the implementation of robust standard errors. However, for Tobit models, such a transformation of the error terms requires the implementation of pooled estimators (also called population averaged estimators). Concretely, pooled estimators simply regress the dependent variable on an intercept and regressors, using both between (cross-section) and within (time series) variation in the data (Cameron and Trivedi 2009). Nevertheless, pooled estimators are assumed to lead to inconsistent parameter estimates when individual fixed effects are needed. Despite this drawback, pooled estimation is preferred in order to have standard errors clustered at the cantonal level.

Logistic regression

Through this third estimation strategy, we want to tackle the probability that the resort to creative accounting occurs. The dependent variable for the logistic regression is "ADCbinary", which is a binary variable taking the value 1 when additional depreciation charges are used and the value 0 otherwise.

The model to be estimated takes the following form:

$$Pr(ADCbinary = 1 \mid X_{ijt}, \beta) = \Lambda(X'_{ijt}\beta)$$

where Pr denotes the probability that creative accounting is used and Λ is the cumulative distribution function of the logistic distribution. X denotes the matrix of independent variables and β is the associated vector of parameters to be estimated through the maxi-

mum likelihood procedure. The independent variables are the same as those for the linear regressions. Then, a cluster-robust estimate is used to correct for heteroskedasticity and autocorrelation for a given canton.[103] Finally, $_i$ identifies Swiss cantons, $_j$ identifies finance ministers and $_t$ identifies years.

Then, in order to ensure the robustness of our results, we also ran a probit model which is very similar to the logit one. The difference between both estimation strategies only relies on their cumulative distribution function since the probit model follows the cumulative distribution function of the standard normal distribution. Cameron and Trivedi (2009) assert that in many cases the fitted probability is very similar over a large part of the range of $X'_{ijt}\beta$.[104]

9.4 Results

In the current subsection, we report the results obtained from the three different estimation strategies. Table 18 reports results for which all variables of interests are estimated all together in a large model.[105] Moreover, we first consider cases during which it is the **governments' financial performance as a whole** that influences the resort to creative accounting. Then, regarding the variables relative to the finance ministers' educational background, we notice that the category "Other" reflecting the other university degrees is omitted. Hence, the interpretation of the results regarding the impact of the finance ministers' educational background on the level of additional depreciation charges is relative to this baseline group.

When looking at Table 18, we note that not all explanatory variables are individually significant. Nonetheless, the joint statistics (F-test and Chi2) reveal that coefficients are jointly statistically significant. This is true independently from the estimation strategy taken into account.

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[103]Similarly to the Tobit estimation, robust standard errors necessitate to run a population averaged model instead of fixed effects models.

[104]It is therefore commonly assumed that the choice between logit versus probit mainly depends on individual preferences. Not wanting to arbitrarily make this choice, we consider more legitimate to employ both estimation strategies.

[105]Short models specifically devoted to each variable of interest ("Balance", "Ideology", "Experience" and "Education") are presented in Appendix Q from Table 66 to Table 71.

Table 18: Importance of finance ministers on the use of creative accounting - Main results

	OLS	PCSE	REGAR	Tobit	Logit	Probit
Error	-0.009	-0.020	-0.023	0.080	0.000**	0.000**
	(0.033)	(0.043)	(0.042)	(0.114)	(0.000)	(0.000)
Rules	15.540	15.364	17.898	21.818	0.141	0.103
	(23.137)	(35.110)	(22.320)	(48.078)	(0.251)	(0.157)
Election	-4.580	-8.631	-6.715	-8.168	0.045	0.023
	(15.170)	(14.865)	(17.447)	(31.107)	(0.111)	(0.069)
Coalition	30.860	26.536	25.012	-20.480	-0.269	-0.174
	(18.906)	(23.641)	(22.127)	(47.519)	(0.188)	(0.117)
Concordance	-0.355	-0.246	-0.216	0.541	0.001	0.001
	(0.759)	(0.886)	(0.770)	(2.750)	(0.009)	(0.005)
Age	3.427	3.774	3.376	7.180	0.026	0.016
	(2.513)	(2.781)	(2.237)	(7.067)	(0.032)	(0.019)
Gender	11.426	0.267	2.511	43.866	-0.003	-0.007
	(46.826)	(62.457)	(34.330)	(117.662)	(0.368)	(0.223)
Balance	0.091***	0.067***	0.073***	0.266***	0.001***	0.000***
	(0.031)	(0.022)	(0.020)	(0.076)	(0.000)	(0.000)
Ideology	9.757	6.951	9.032	19.849	-0.037	-0.022
	(10.385)	(10.299)	(9.742)	(44.002)	(0.124)	(0.077)
Experience	-0.220	-0.277	-0.215	-0.755	-0.004	-0.002
	(0.250)	(0.320)	(0.260)	(0.651)	(0.003)	(0.001)
Apprenticeship	-4.722	-4.943	-6.048	43.376	0.314	0.184
	(32.044)	(41.098)	(38.293)	(96.822)	(0.349)	(0.209)
Economics	151.036***	144.224***	156.755***	264.580*	0.631	0.408
	(47.782)	(48.902)	(41.804)	(141.879)	(0.415)	(0.251)
Law	29.527	14.285	21.277	21.005	0.101	0.067
	(31.116)	(44.743)	(37.351)	(87.433)	(0.395)	(0.238)
Politics	19.782	-4.331	3.368	87.302	0.913	0.554
	(71.728)	(135.294)	(75.946)	(140.349)	(0.738)	(0.453)
Constant	-278.911	-410.235	-275.811	-701.642	-0.991	-0.600
	(199.580)	(257.193)	(147.903)	(571.051)	(2.175)	(1.329)
Cantonal FE	YES	YES	YES	NO	NO	NO
Time FE	YES	YES	YES	NO	NO	NO
R2 / Log likelihood	23.080	28.030	21.03	-2519.340	0.000	0.000
Joint	2.310	1.480	3.740	3.080	44.740	44.150
p-value	0.0000	0.0000	0.0000	0.007	0.000	0.000
N	729	729	703	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

The first element of analysis concerns the impact of the corrected balance of the statement of financial performance on creative accounting operations. When considering linear regression models (OLS, PCSE and REGAR), the parameters associated to the variable "Balance" point out a positive and significant relationship with the level of additional depreciation charges. This means that reported amounts of additional depreciation charges increase with the size of the corrected balance of the statement of financial performance. In other words, larger corrected balances are associated to larger amounts of additional depreciation charges. In the light of the results obtained through the OLS estimation, a larger balance of 1 CHF per capita, just before reporting, leads finance ministers to record additional depreciation charges of about 0.09 CHF per capita. Nonetheless, coefficients appear to be sensitively smaller when estimated through PCSE and REGAR. Results ensuing from the Tobit estimator appear to be consistent since the parameter associated to the variable "Balance" is also positive and strongly significant. Then, the two other estimators (Logit and Probit) tackle the influence of the corrected balance of statement of financial performance on the probability that additional depreciation charges are reported in public figures. The parameter associated to the variable "Balance" is positive and statistically significant at the 99% level. This result provides strong evidence that the occurrence of creative accounting operations is strongly tied to the balance of the statement of financial performance. Moreover, since the relation is positive, the larger the balance before reporting is, the larger the probability that finance ministers resort to accounting manipulations.

This being said, results do not support our hypothesis that the finance ministers' political ideology matters for the level of additional depreciation charges. The variable "Ideology" is not statistically significant and its associated coefficient reveals a positive sign contrary to our expectations. The same evidence is seen when we tackle whether the probability of recording additional depreciation charges depends on the finance ministers' political ideology. Results do not show a significant influence of the variable "Ideology" on the occurrence of creative accounting operations either. However, whereas the coefficient of the variable "Ideology" is revealed to be positive when the model is estimated through linear regressions, the coefficient turns out to be negative when the model is estimated either by Logit or by Probit. As the

the variable "Ideology" does not show any statistical significance, our hypothesis stipulating that left-wing finance ministers would use additional depreciation charges more often and to a larger extent than right-wing ones must be rejected. Interestingly enough, the resort to creative accounting and especially to additional depreciation appears to be independent from the finance ministers' political ideology.

Similar conclusions are drawn regarding the finance ministers' political experience since the variable "Experience" does not show any statistical significance. Moreover, conversely to our expectations, its associated parameter is negative. One must therefore conclude that the greater experience gained through a longer tenure as finance minister is not associated with a larger resort to creative accounting operations. The sign of the coefficient associated to the variable "Experience" even tends to demonstrate the contrary, i.e. more experienced finance ministers would resort to creative accounting operations to a lesser extent. Moreover, analogous results are obtained through logistic regressions. Therefore, the time a finance minister spends in office does not affect his probability to manipulate public figures during the reporting process either.

The following variables of interest examine whether the finance ministers' educational background determines the amounts recorded as additional depreciation charges. Consistently with our hypothesis, the parameter associated to the variable "Economics" is positive and significant. This is at least true for linear regression models (OLS, PCSE and REGAR). Finance ministers who have a university degree in economics use additional depreciation charges to a greater extent than finance minister who have another education. This supports our belief that the former have better knowledge in accounting which provides them with greater abilities to manipulate reported figures when needed. No other training significantly determines the reported amounts of additional depreciation charges. Quite similar results are obtained with the Tobit estimator. However, although the variable "Economics" shows a positive sign, it is only statistically significant at the 90% level. The picture is then slightly different when considering results obtained through logistic regression models. In these models, the variables of interest indicates whether the finance ministers' educational background influences the probability of recording additional depreciation charges. Contrary to linear

regression models, the parameters associated to the variable "Economics" are not significant although they highlight a positive sign. Therefore, in the light of the logistic regression models, results do not verify our hypothesis suggesting that finance ministers in possession of a university degree in economics are more likely to use additional depreciation charges than finance ministers who have any other training. Nonetheless, when trained economists resort to creative accounting, they book larger amounts of additional depreciation charges compared to other finance ministers.

Turning to the set of control variables present in linear regression models, none of them ever brings out a significant influence on the amount recorded as additional depreciation charges. As to control variables estimated through logistic regressions, comparable results are obtained. Only the variable "Error" appears to significantly influence the probability of resorting to additional depreciation charges. As hypothesized, the underestimation of tax revenues during the budgeting process is equivalent to good news during the reporting process, corrective action may thus be needed to hide these higher revenues. However, this result must be interpreted with caution since the significance of the variable "Error" is only revealed with Logit and Probit estimators.

As shown in Subsection 6.3, the use of creative accounting in Swiss cantons seems to vary depending on whether finance ministers have to deal with public surpluses or public deficits. Table 19 below presents results for cases during which finance ministers enjoy the occurrence of **a surplus of the statement of financial performance**. According to results ensuing from this new estimation strategy, the large model reveals that a surplus of 1 CHF per capita engenders the resort to additional depreciation charges by finance ministers comprised between 0.13 CHF per capita (REGAR) and 0.19 CHF per capita (OLS) on average. Moreover, similar evidence is provided by results ensuing from the model estimated with the Tobit estimator. In both short and large models, the parameter associated to the variable "Surplus" is positive and strongly statistically significant.

However, whereas the coefficient of the variable "Economics" shows a positive sign, the variable is only statistically significant at the 95% and 90% levels when estimated with OLS and REGAR estimators respectively. The influence of trained economists on the amount

recorded as additional depreciation charges is even revealed to be insignificant when the model is estimated with the Tobit estimator.

Table 19: Results of the linear regression models - Estimation with "Surplus"

	OLS		REGAR		Tobit	
	Short	Large	Short	Large	Short	Large
Error	0.003	-0.007	-0.044	-0.047	0.033	0.009
	(0.038)	(0.042)	(0.048)	(0.048)	(0.101)	(0.118)
Rule	46.380*	49.105**	51.027*	59.177**	28.986	14.905
	(24.907)	(24.689)	(29.303)	(29.682)	(64.360)	(57.479)
Election	-16.118	-16.099	-20.191	-19.891	-23.945	-20.748
	(20.110)	(19.837)	(20.166)	(20.389)	(23.585)	(24.386)
Coalition	12.728	17.292	-1.275	-0.683	-54.905	-60.945
	(23.758)	(23.589)	(27.813)	(27.615)	(57.799)	(57.949)
Concordance	-1.846	-1.384**	-1.624*	-1.403	-1.182	-0.016
	(0.740)	(0.553)	(0.901)	(0.879)	(3.453)	(3.170)
Age	1.731	2.590	1.112	1.416	2.066	3.415
	(2.617)	(2.859)	(2.236)	(2.666)	(6.430)	(7.301)
Gender	109.456**	103.486*	78.255*	80.803*	148.076	152.335
	(50.025)	(52.992)	(45.798)	(45.141)	(110.839)	(130.687)
Surplus	0.221***	0.193***	0.158***	0.138***	0.311***	0.264***
	(0.048)	(0.045)	(0.034)	(0.035)	(0.109)	(0.083)
Ideology		12.687		0.492		24.020
		(14.383)		14.781		(43.523)
Experience		-0.019		0.088		-0.115
		(0.303)		(0.338)		(0..797)
Apprenticeship		-39.613		-36.753		-45.161
		(47.666)		(52.475)		(93.747)
Economics		110.304**		96.686*		188.049
		(49.780)		(54.895)		(118.067)
Law		8.522		-14.711		2.489
		(45.119)		(50.541)		(78.634)
Politics		-11.272		-77.635		95.426
		(102.853)		(111.049)		(687.842)
Constant	7.695	-157.114	308.356	319.557	-14.341	-302.536
	(193.533)	(205.027)	(104.274)	(116.599)	(407.857)	(484.975)
Cantonal FE	YES	YES	YES	YES	NO	NO
Time FE	YES	YES	YES	YES	NO	NO
R-Squared	0.173	0.190	0.141	0.177	-2009.241	-1998.947
F-stat	4.650	4.530	2.570	2.530	2.850	3.110
p-value	0.000	0.000	0.000	0.000	0.022	0.007
N	470	470	444	444	470	470

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Then, paying attention to the set of control variables, fiscal rules appear to influence the use of creative accounting in cases of surpluses as the parameter associated to the variable "Rule" is positive and statistically significant at the 95% level. This suggests that, in presence of surpluses, finance ministers would use to additional depreciation charges to a larger extent when they face more stringent fiscal rules. Nonetheless, this finding is not confirmed by results obtained with the Tobit estimator.

Moreover, although the resort to additional depreciation charges should only occur when the balance of the statement of financial performance is positive, statistical analysis has demonstrated that the use of creative accounting in Swiss cantons also occurs during time of deficits. Finance ministers may therefore be suspected of having sometimes resorted to big bath accounting when they had to cope with **a deficit of the statement of financial performance**. Detailed results of this new estimation strategy are presented in Table 20 below. In the light of the results presented in the table below, it cannot be asserted that big bath accounting has been significantly carried out in Swiss cantons through the use of additional depreciation charges. Indeed, although the coefficient associated to the variable "Deficit" is positive, the variable is not statistically significant. In other words, amounts booked as additional depreciation have not increased with the size of public deficits over the considered period.

Furthermore, political experience seems to have influenced the way finance ministers use creative accounting in cases of public deficits. More precisely, more experienced finance ministers are associated with smaller amounts of additional depreciation charges. The variable "Experience" shows a negative coefficient. However, results should be interpreted with caution as the variable is only statistically significant at the 99% level when the model is estimated with the REGAR estimator.

Like the previous models revealed, trained economists appear to be associated to larger amounts of additional depreciation charges. Nonetheless, although the variable "Economics" shows a positive sign, its statistical significance is relatively low. Besides, the variable does not show any statistical significance when the model is estimated with the Tobit estimator.

Table 20: Results of the linear regressions model - Estimation with "Deficit"

	OLS		REGAR		Tobit	
	Short	Large	Short	Large	Short	Large
Error	0.020	0.064	0.047	0.095	0.146	0.162
	(0.077)	(0.090)	(0.095)	(0.098)	(0.308)	(0.303)
Rule	-114.101**	-89.207**	-140.887**	-62.911	-32.024	-61.390
	(54.851)	(45.224)	(62.862)	(63.824)	(129.861)	(125.516)
Election	-3.795	0.342	-24.275	-2.457	68.893	68.054
	(34.741)	(33.393)	(31.608)	(30.452)	(118.972)	(124.846)
Coalition	72.574	78.145	66.652	29.757	176.152	158.383
	(50.707)	(51.347)	(59.470)	(59.818)	(176.139)	(206.784)
Concordance	-2.589	-2.941	0.158	1.650	3.950	3.708
	(2.384)	(2.403)	(3.136)	(3.081)	(11.606)	(9.070)
Age	0.945	10.239	1.934	3.081**	9.151	28.621
	(3.429)	(8.337)	(5.162)	(6.996)	(17.024)	(24.098)
Gender	-59.614	-57.054	-125.749	-142.564*	-199.947	-159.957
	(107.462)	(87.432)	(83.834)	(82.674)	(476.711)	(321.310)
Deficit	0.077	0.083	0.049	0.054	0.176	0.106
	(0.065)	(0.058)	(0.055)	(0.053)	(0.267)	(0.269)
Ideology		-16.029		-19.557		7.989
		(13.565)		(21.020)		(136.075)
Experience		-1.445*		-1.954***		-3.919
		(0.860)		(0.660)		(2.781)
Apprenticeship		95.0953**		104.117		300.671
		(45.052)		(87.862)		(263.273)
Economics		159.878**		192.019*		397.621
		(78.855)		(108.471)		(405.012)
Law		13.407		-66.134		56.683
		(43.701)		(95.725)		(246.117)
Politics		53.235		-7.199		263.370
		(112.282)		(162.754)		(307.382)
Constant	31.549	-311.678	4.588	178.650	-2057.187	-2890.218
	(225.341)	(412.138)	(98.861)	(94.355)	(1720.788)	(1776.776)
Cantonal FE	YES	YES	YES	YES	NO	NO
Time FE	YES	YES	YES	YES	NO	NO
R-Squared	0.179	0.255	0.189	0.247	-476.603	-470.696
F-stat	88.750	82.950	2.370	2.860	0.260	1.370
p-value	0.000	0.000	0.000	0.000	0.973	0.237
N	259	259	233	233	259	259

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Hereafter, when looking at the set of control variables, the variable "Rule" seems to offer interesting information. In cases of deficits, it would appear that finance ministers resort less to creative accounting when they simultaneously have to deal with stringent fiscal rules. That way, in such particular circumstances, the more finance ministers have to deal with stringent a fiscal rules, the least they book additional depreciation charges. This is at least what the negative sign of the coefficient associated to the variable "Rule" suggests. However, this relationship between the stringency of fiscal rules and the use of additional depreciation charges has only been revealed to be statistically significant when models are estimated through OLS and REGAR estimators.

Finally, we may conclude that the resort to creative accounting is mainly driven by the financial situation in Swiss cantons. However, we cannot rule out that the finance ministers' educational background is also a crucial determinant of the level of additional depreciation charges reported in public figures.

9.5 Robustness checks

In order to ensure the validity of the initial results, four robustness checks were carried out. As previously mentioned, the focus of this second analysis is on investigating the determinants of the amounts reported as additional depreciation charges. Nonetheless, additional tests presented in this subsection are only applied on linear regression models (OLS, PCSE and REGAR).

Exclusion of the canton of Uri

As already discussed, the canton of Uri (UR) is a particular case since its average amount of additional depreciation charges is drastically higher than in other Swiss cantons. Consequently, in order to make sure that the canton of Uri (UR) does not single-handedly influence the whole results, we have excluded it from the data set and have re-estimated the various models. Results are presented in Appendix Q in tables 72, 73 and 74. Generally, in spite of the exclusion of Uri, results are consistent with those obtained through the initial estimation strategies. The only difference concerns the variable "Economics". Compared to initial

results, the variable shows smaller coefficients and is now statistically significant at the 95% level. This shift may obviously be attributed to the exclusion of Carlo Dittli who accounts for very high amounts of additional depreciation charges. Despite everything, in the light of the results ensuing from the robustness check, it may reasonably be concluded that our main results are robust.

Exclusion of cantonal and time fixed effects

In the initial estimation strategy, linear regression models sensitively differ from the Tobit and logistic regression models. Whereas the former models include both cantonal and time fixed effects, the latter models are void of such fixed effects. Wanting to evaluate whether the inclusion of cantonal and time fixed effects affect the overall results, we re-estimated linear regression models without them. Moreover, standard errors were only clustered at the cantonal level for the OLS estimation in order to be consistent with Tobit and logistic regressions models.

Results obtained after the exclusion of cantonal and time fixed effects appear to be similar to the initial ones. The variable "Balance" brings out identical coefficients and the variable remains strongly significant at the 99% level with regard to the three different estimators. However, in spite of a stable coefficient, the variable "Economics" partly looses its significance when estimated through OLS and PCSE. Detailed results are presented in tables 75, 76 and 77 in Appendix Q.

Inclusion of a time trend

Even though descriptive statistics did not demonstrate this, it may be wondered whether the use of creative accounting has evolved at a constant rate over time during the considered period. Assuming that finance ministers implicitly carry out a learning process allowing them to become more and more comfortable with accounting over time, we cannot rule out that their resort to creative accounting increases year after year. In order to take into account this eventuality, we re-estimated initial models after having had a time trend. The series for the variable "Trend" has the property of increasing by the same constant amount each time

period. Results reported in tables 78, 79 and 80 in Appendix Q are strictly similar to those obtained in initial estimations. Moreover, the variable "Trend" does not reveal any statistical significance suggesting that the amounts reported as additional depreciation charges do not follow a constant evolution over time.

Shorter time series

Finally, the last robustness check consisted in re-estimating models on a shorter time period. As Swiss cantons had not implemented the HAM1 the same year, the panel is strongly unbalanced. Besides, even if it should not have been the case, we cannot rule out that some cantons chose the year of implementation for strategical reasons. Therefore, in order to alleviate the potential influence of the unbalanced panel, we ran linear regression models on a shorter period going from 1997 to 2012, i.e. as the canton of St-Gallen (SG) was the last canton to have implemented the HAM1, in 1997.

In light of the results reported in tables 81, 82 and 83, coefficients associated to the variable "Balance" seem to be sensitively smaller than usual. Whereas those coefficients were comprised between 0.067 and 0.091 in the initial models, they are now bounded between 0.053 and 0.064. Moreover, when estimated through PCSE and REGAR, the variable is only significant at the 95% level. Similar considerations can also be formulated regarding the variable "Economics". Whereas its respective coefficients appear to be consistent with those initially obtained, the variable is slightly less significant when models are estimated on a shorter time period.

9.6 Summary and discussion of the results

The initial econometric results as well as the additional robustness checks reveal that our results are robust. Mainly they confirm and support hypothesis that additional depreciation charges strongly depend on the level of the statement of financial performance before reporting. More precisely, the resort to additional depreciation charges is significantly likely to occur when the corrected balance of the statement of financial performance is large. Besides, results have not confirmed that finance ministers give the bath to the statement of

financial performance when they have to cope with a deficit. However, the use of additional depreciation charges strongly depends on the size of public surpluses. Therefore in cases of surpluses, results demonstrate that a surplus of 1 CHF per capita before reporting leads finance ministers to record amounts of additional depreciation charges comprised between 0.13 CHF per capita and 0.22 CHF per capita. In other words, just because of additional depreciation charges, reported surpluses of the statement of financial performance are on average 13% or even 22% smaller than a true and fair reported surplus would be, all other things being equal.

Although this finding may appear quite trivial, it is the first time that such an analysis is carried out while it is commonly known that additional depreciation are used to conceal surpluses reported in the statements of financial performance. At the same time, in addition to demonstrating the phenomenon, we quantify it. Furthermore, results provide evidence that the use of additional depreciation charges is not random but obviously follows particular rules. Indeed, in the light of the results, it is proved that the use of additional depreciation charges is tightly stuck to the cantons' financial situation. And to some extent, this gives insights as to the finance ministers' rationality and comprehension of the stakes surrounding the public sector financial management.

Simultaneously, it could suggest that finance ministers could have personal interests in keeping out surpluses from the stakeholders' hands part of the budgetary policy-making process. This current element may be a moot point. As assumed in this essay, finance ministers should be distinguished from spending ministers as they are the only ones who care and/or have a personal interest in sound public finance. Consequently, knowing that additional depreciation charges are an efficient tool to improve the governments' financial performance, it is all the more logical that finance ministers resort to such gimmicks in order to reach their own targets.

Nonetheless, such practices are obviously questionable. We may indeed wonder whether it is legitimate for finance ministers to embrace strategical behaviors in regard to spending ministers, deputies and eventually citizens. Is it the role of the agent to develop and apply particular plans of action in the sole purpose of misleading the principals? Conversely, if

finance ministers really and only aimed at ensuring fiscal soundness, should they not spend time educating stakeholders about the necessity of running a structural surplus (or at least to avoid a structural deficit) instead? It could be even more relevant as without sufficient financial means on the long run, public policies under the direction of spending ministers could certainly not be implemented anymore. It is all about transparency and thus fairness vis-à-vis the stakeholders of the budgetary process and citizens. Unfortunately, finance and spending ministers as well as deputies probably only have one ultimate common objective which is the willingness to be reelected. It is therefore strongly doubtful that such a learning process could be undertaken. Indeed, whereas finance ministers are evaluated on their capacity to ensure fiscal soundness, spending ministers and deputies need greater financial means to highlight their competences; both criteria being discordant and mutually exclusive.

Furthermore, in light of our results, other interesting conclusions may be drawn regarding the role played by the finance minister in government. Whereas our initial hypothesis was that finance ministers' personal characteristics could influence the way public finance are managed (at least in Swiss cantons), such a relation has not been clearly demonstrated through the current empirical research. Indeed, the resort to creative accounting has been revealed to be mainly driven by the occurrence and the level of a surplus reported in the statement of financial performance. Concerning the importance of the finance ministers' personal characteristics, only the educational background was demonstrated as a factor influencing the amounts reported as additional depreciation charges. In particular, results provide evidence that finance ministers who have a university degree in economics are most likely to resort and to a larger extent to creative accounting. These findings could suggest that trained economists could be better equipped regarding technical issues for their position since they are elected. Their adaptation period should be shorter than finance ministers who do not have any accounting knowledge. Moreover, these results reasonably suggest that trained economists are practically the only ones who have knowledge in accounting. Such competence in accounting would therefore, consistent with our assumption, give them the opportunity to create an information asymmetry between themselves on the one side and the other stakeholders on the other side. At the same time, since these finance ministers are

expected to be more reluctant to showing a structural deficit, it appears reasonable to argue they use additional depreciation charges more largely in order to put operating expenses under pressure and to restrain the tax burden. However, the use of creative accounting in Swiss cantons seems to be totally independent from the finance ministers' political ideology and experience. In other words, despite their position on the political spectrum and their tenure, finance ministers resort to creative accounting in order to hide surpluses.

This also gives interesting food for thought regarding policy implications. Even though it cannot be asserted that a finance minister does not matter in government, results have demonstrated that every finance minister embraces the same behavior as to the use of creative accounting under particular circumstances. We may therefore question whether the finance minister's behavior would not be mainly or even only driven by institutional and economic constraints. Indeed, according to the stringency of these constraints, it cannot be ruled out that finance ministers face a lack of elbowroom allowing them to append their own trademark on the public sector finance management. In other words, regardless of their political ideology or experience, it could be the position and the tasks to be fulfilled that would drive the way finance ministers manage cantonal public finance.

Moreover, independently from their time in position or their political color, finance ministers (are expected to) have the common objective of ensuring fiscal soundness and ultimately increasing their reelection chances. Since additional depreciation charges represent an efficient mechanism to structurally improve fiscal soundness over time, it is in the interest of finance ministers to use such an accounting trick. Put differently, a finance minister looking for reelection has no reason to deprive himself of such a tool regardless of his personal characteristics. At least, in light of the results presented in this research, everything suggests that, for finance ministers, the end justifies the means.

10 Conclusion

This research has been realized with the aim to deepen and broaden the comprehension of creative accounting in the public sector. Although the study of this phenomenon is not new, the approach we have embraced to perform this research is undoubtedly innovative. Indeed, whereas it is almost exclusively debated that creative accounting occurs in the sole purpose of hiding public deficits, we bring proof that finance ministers may have strong incentives to conceal surpluses and play a key role in this issue.

Being assessed by voters on their capacity to ensure fiscal soundness, finance ministers are expected to be keen on saving surpluses in order to structurally improve the governments' financial performance. By doing so, they implicitly make sure to run a structural surplus, which can be used to avoid the risk of reporting deficits during economic downturns. That way, by reporting sound public finances over the years, finance ministers should increase their reelection chances. However, it is hardly justifiable for finance ministers to report a surplus since it would indicate that the provision of public services was too weak compared to the taxes paid by citizens. In that case, claims from spending ministers, deputies and eventually from citizens aiming at reducing taxes and/or increasing public spending could appear.

Nonetheless, thanks to accounting tricks, finance ministers give themselves the possibility to avoid such claims by artificially worsening the reported balances of the statement of financial performance. By reporting a lower surplus compared to the true and fair one, finance ministers justify maintaining higher tax rates than needed while putting public spending under pressure. That way, by restraining the level of public spending and by simultaneously generating high revenues, those tricks are expected to improve the future governments' financial performance. This is at least the first research question that was tested in this essay.

Two specific kinds of accounting tricks are used in Swiss cantons, they are additional depreciation charges and operations on special funds. Although the use of both accruals is ruled by the Harmonized Accounting Model (HAM1) for Swiss cantons as well as by most of the cantonal financial laws, additional depreciation charges and operations on special funds systematically alter the true and fair view of reported figures and therefore violate the basic

philosophy of the IPSAS norms. When assessing additional depreciation charges and special funds in light of IPSAS norms, both operations have to be considered as creative accounting. Indeed, additional depreciation charges inflate operating expenses because they go beyond the actual wear and tear and obsolescence of assets and do not imply any disbursement. Operations into cookie-jar reserves do not have any economic reality: they either inflate operating expenses when allocations are larger than withdrawals while they inflate operating revenues when withdrawals are larger than allocations.

In addition to relying on the freedom given by the HAM1 and cantonal financial laws, finance ministers enjoy a relatively high information asymmetry allowing them to carry out creative accounting operations and thus to reach their own targets. Compared to spending ministers and deputies, finance ministers have a specific expertise in financial issues that make it quite easy for them to manipulate reported figures without being worried. Moreover, politicians associated to the budgeting process do not call additional depreciation charges and special funds into question since they are legal. Since public accounts are scrutinized by auditors who evaluate the respect of cantonal financial laws, additional depreciation charges and operations on special funds are validated even if they violate the true and fair representation of the governments' financial performance. Therefore, finance ministers have all the latitude they want to shape reported figures according to their own interests.

However, although each finance minister is likely to resort to creative accounting in order to reach self-interested goals, we support the fact they all use creative accounting in a different way. Following recent research providing evidence that the elected politicians can be driven by their personal characteristics, we have investigated whether the same occurs in our field of interest. That way, as second research question, we tackled whether the finance ministers' political ideology, experience and educational background impact the extent to which books are cooked when a surplus or a deficit occurs during the reporting process.

To test the hypothesis relative to the impact of creative accounting on the governments' financial performance and the one devoted to the role played by finance ministers in the use of accounting gimmicks, we first performed a qualitative analysis carried out with nine experts in the field of Swiss public finance and the 26 cantonal administrations of finance.

Additionally, we also performed two quantitative analysis relying on panel data based on the 26 Swiss cantons and on the 116 finance ministers in position between 1980 and 2012. Firstly, the objective of the qualitative analysis was to give the first insight as to the use and consequences of creative accounting in Swiss cantons and the role played by finance ministers in this issue. As this kind of information is not available through official channels (Swiss cantons websites, public accounts, etc.), the resort to auditors, practitioners, scholars and civil servants working on the ground everyday constitutes a valuable asset for the current research. In addition to discussing hypothesis formulated in this research, discussants also deepened and broadened our knowledge regarding our field of research. Moreover, they also provided good food for thought about the interpretation of the results ensuing from the two quantitative analysis. Secondly, concerning the quantitative analysis investigating the explanation of public balances, two different models were tested. The first model consists in a single equation model where the balance of the statement of financial performance (surplus or deficit) is the dependent variable. In the second model, the impact on the balance is indirectly estimated through a simultaneous equations model where the level of operating revenues and the level of operating expenses are estimated simultaneously. This simultaneous strategy allowed us to disentangle the respective effect of creative accounting operations on operating revenues and operating expenses and therefore provide more precise estimations than the single equation model. Thirdly, three different estimation strategies were considered in order to investigate the extent to which finance ministers matter in the use of creative accounting. Using linear regression models and Tobit estimations, we first aimed at determining the level of creative accounting operations reported in cantonal statements. By running logistic regressions, we then tackled the probability to which creative accounting operations depend on the finance ministers' personal characteristics.

Based on several estimators, econometric results referring to the impact of creative accounting on governments' financial performance were proved robust. As expected, results significantly support that creative accounting allows the improvement of future balances reported in the statement of financial performance by simultaneously putting operating expenses under pressure and by generating additional operating revenues. Nonetheless, the

influence of accounting tricks has been revealed to be stronger on operating expenses than on operating revenues. Consistently with other research in the field of local public finance, results provide new evidence that improving governments' financial performance is usually mainly achieved through a reduction of public spending instead of higher revenues. Concretely, according to the considered estimators, it has been demonstrated that 1 CHF per capita of additional depreciation charges improves the balance of the coming year by about 0.30 to 0.50 CHF per capita. Then, when considering the simultaneous equations model, 1 CHF per capita reported as additional depreciation charges respectively allows to decrease future operating expenses by about 0.30 CHF per capita and to increase future operating revenues by 0.26 CHF per capita. Nevertheless, special funds are revealed ineffective to structurally improve the governments' future financial performance since they have no significant effect neither on the operating expenses nor on the operating revenues. No statistical significance was revealed when the balance of the statement of financial performance was directly estimated. Therefore, special funds are rather expected to smooth the governments' financial performance over time. In other words, whereas additional depreciation charges appear to structurally increase public balances, special funds would only allow to absorb the shocks of the business cycle.

Moreover, we were interested in knowing whether the improvement of the governments' financial performance over the considered period has mainly been due to larger surpluses, smaller deficits or a combination of both phenomenons. Results demonstrated that additional depreciation charges allowed to improve the balance of the statement of financial performance by generating larger surpluses. On average, 1 CHF per capita recorded as additional depreciation charges engendered an increase of public surpluses of about 0.23 CHF per capita. However, additional depreciation charges have not been revealed efficient to put public deficits under pressure. Concerning operations on special funds, they have been shown to be ineffective to ensure larger surpluses or to alleviate public deficits.

Regarding models dealing with the determinants of creative accounting, results also appeared to be strongly robust and simultaneously confirmed some of the formulated hypothesis. Through the different estimation strategies, we highlighted the fact that the amount reported

as additional depreciation charges is significantly and positively correlated with the level of the balance before reporting. We have confirmed the hypothesis that the use of additional depreciation charges in Swiss cantons is positively related to the occurrence and the level of public surpluses in particular. On average, it has been demonstrated that a surplus before reporting of 1 CHF per capita leads finance ministers to record additional depreciation charges by about 0.22 CHF per capita. Consequently, we have provided evidence that creative accounting may also be *preventive* when it consists in saving surpluses through unorthodox practices. Creative accounting is thus not only a *corrective* process embraced by governments in order to hide public deficits. At the same time, it reinforces our assertions that reporting surpluses may also be as delicate as reporting deficits. Whereas it could have been expected that additional depreciation charges have also been used in Swiss cantons in order to worsen the governments' financial performance in cases of public deficits, the occurrence of big bath accounting has not been confirmed by empirical analysis.

Furthermore, the resort to creative accounting in Swiss cantons appears to mainly depend on the occurrence and the level of surplus as it has not been clearly demonstrated that finance ministers significantly influence the way additional depreciation charges are used in Swiss cantons. Finance ministers' personal characteristics do not appear to be key determinants of creative accounting. Only the educational background has been revealed to influence the probability and the extent to which finance ministers have executed accounting tricks during the reporting process in order to artificially conceal good news. More concretely, finance ministers who have a university degree in economics are associated to larger amounts of additional depreciation charges. This would also tend to confirm our assumption that people who possess accounting knowledge profit from information asymmetry as to the understanding of reported figures. However, political ideology and experience do not affect the way finance ministers resort to creative accounting. Instead of appending their own trademark on the public policies they are in charge of, it appears it is mainly the position and the tasks to be fulfilled that drive finance ministers' behavior.

Thanks to its undoubtedly innovative aspects, this research provides new and relevant knowledge regarding the phenomenon of creative accounting, as well as a better and broader

comprehension of the explanation of governments' financial performance. New evidence is also provided as to the role played by finance ministers in governments. Notably, through the discussions of the results following the qualitative and the two quantitative analysis, we have largely filled in the knowledge gap initially formulated. However, in spite of these successes, improvements can be still made.

The measure of creative accounting and especially of depreciation charges would constitute the most valuable improvement of the current research. Indeed, while additional depreciation charges have especially been implemented to put the statement of financial performance under pressure, it is commonly known that Swiss cantons may also have discretionary manipulated ordinary depreciation charges with the same purpose. Consequently, extracting the amounts without economic reality that are reported in the statement of financial performance would provide a betterment for future researches. To do so, more or less sophisticated methodologies aiming at capturing those unfair amounts have been discussed in the literature. Although there is no consensus regarding the most effective method to measure the unexpected depreciation charges, some of them have already been tested and have been proved effective. Notably, the methodology developed by Marquardt and Wiedman (2004) and applied by Pilcher and Van Der Zahn (2010) has given interesting results. In their research, they assume that depreciation charges should remain a constant proportion of gross property, plant and equipments from one year to another; the gap between the current amount and the trend referring to the unexpected part of depreciation charges. That way, combining additional depreciation charges to ordinary depreciation charges that are discretionary manipulated would offer the possibility to bring out a new and more accurate measure of the corrected balances of the statements of financial performance. In other words, we would be in a better position to highlight a true and fair view of the governments' financial performance over the considered period. Following this methodology could also provide new and more accurate evidence as to the impact of creative accounting on public deficits as well as the role played by finance ministers in the use of such gimmicks.

Finally, new evidence has been provided as to the role played by finance ministers in governments. Notably, it has been shown that, independently from their personal characteristics

(with the exception of trained economists), finance ministers in general embrace the same strategy regarding the use of creative accounting, namely they use it to hide good news. Besides we strongly postulate that finance ministers strategically use creative accounting in order to alleviate the spending appetite of other government members and ultimately report better financial performance over time. Being assessed by voters on their capacity to ensure fiscal soundness, we assume that finance ministers, through the use of creative accounting, aim at reporting good financial performance over time and thus at increasing their reelection chances. Whereas such an argument is widely defended, no empirical evidence to support it has been provided so far. An extension of the research could therefore consist in investigating whether the governments' financial performance effectively affects the reelection probability of incumbent finance ministers.

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Appendix

A - Statement of financial performance according the classification of the HAM1

Table 21: Statement of financial performance according to the classification of the HAM1

	3 - *Expense*	4 - *Revenue*	
No.	Account. Entry	Account. Entry	No.
30	Wages	Tax revenues	40
31	Supplies and consumables used	Royalties and concessions	41
32	Interest costs	Assets and financial revenues	42
33	Depreciation charges	Contributions	43
331	Ordinary depreciation charges	Share to revenue without allotment	44
332	Additional depreciation charges	Reimbursments of juridictions	45
34	Contributions	Received grants	46
35	Transfer expenses	Grants to be distributed	47
36	Allowed grants	Withdrawals from special funds	48
37	Grants to be distributed	Internal service charges	49
38	Allocation to special funds		
39	Internal service charges		

B - Average annual amounts of additional depreciation charges

Table 22: Time series presentation of additional depreciation in real terms per capita

Canton	N	Mean	Std. dev.	Min	Max	Occurrence
1980	9	31.25	62.57	0.00	178.79	3
1981	10	55.19	95.85	0.00	263.76	6
1982	13	58.90	98.46	0.00	321.27	6
1983	14	34.38	69.27	0.00	248.36	6
1984	15	41.11	86.47	0.00	290.40	5
1985	15	98.17	298.65	0.00	1'170.44	6
1986	17	109.59	200.31	0.00	754.23	8
1987	19	128.05	200.52	0.00	811.85	10
1988	21	178.29	254.62	0.00	788.79	12
1989	21	161.03	281.63	0.00	1'261.12	13
1990	22	130.75	249.91	0.00	1'055.10	12
1991	22	94.28	233.71	0.00	948.60	9
1992	22	114.71	270.74	0.00	1'142.30	8
1993	22	121.58	235.62	0.00	1'003.21	14
1994	22	180.18	276.51	0.00	972.93	13
1995	24	109.13	221.79	0.00	941.62	12
1996	25	100.10	194.96	0.00	773.95	11
1997	26	59.91	144.20	0.00	559.18	7
1998	26	24.14	75.48	0.00	377.56	8
1999	26	41.21	107.24	0.00	407.21	7
2000	26	37.65	114.33	0.00	464.37	7
2001	26	58.54	111.01	0.00	398.67	9
2002	26	91.57	262.84	0.00	1'304.73	10
2003	26	63.26	136.67	0.00	611.84	10
2004	26	77.41	163.59	0.00	605.02	10
2005	26	479.16	797.82	0.00	2'827.58	18
2006	26	152.55	278.47	0.00	1'175.75	14
2007	26	166.29	232.20	0.00	767.64	16
2008	26	197.86	273.39	0.00	930.50	15
2009	26	78.73	141.15	0.00	501.11	13
2010	26	72.63	173.04	0.00	782.28	10
2011	26	58.52	115.00	0.00	369.91	8
2012	26	32.09	69.14	0.00	245.74	7
Mean		104.19	197.79	0.00	765.33	10

Source: Swiss cantons accounts and own calculations

C - Average annual amounts of the net allocation to special funds

Table 23: Time series presentation of the net allocation to special funds in real terms per capita

Canton	N	Mean	Std. dev.	Min	Max	Occurrence
1980	9	57.69	81.09	0.00	252.19	8
1981	10	34.53	86.85	-88.31	216.53	5
1982	13	1.22	70.33	-121.41	142.49	8
1983	14	-0.77	50.81	-129.37	54.38	10
1984	15	-17.33	91.12	-319.00	74.19	7
1985	15	11.24	76.88	-114.31	251.66	10
1986	17	34.30	98.55	-81.64	290.61	11
1987	19	26.10	58.38	-104.16	142.07	13
1988	21	55.49	149.61	-113.71	551.92	11
1989	21	-5.25	47.94	-107.12	80.96	11
1990	22	-19.04	127.07	-419.22	208.60	11
1991	22	-51.37	140.08	-568.39	105.64	8
1992	22	-21.65	110.43	-328.69	244.16	11
1993	22	-15.14	102.84	-402.52	131.04	11
1994	22	-13.49	71.08	-275.78	71.78	12
1995	24	21.53	140.01	-293.99	565.10	17
1996	25	-9.59	100.82	-354.40	83.30	17
1997	26	-2.63	131.87	-302.51	359.40	14
1998	26	-12.12	240.56	-959.85	528.14	17
1999	26	-16.57	117.57	-466.28	168.13	14
2000	26	43.74	199.26	-365.05	779.23	15
2001	26	-7.26	156.42	-564.28	346.64	15
2002	26	-29.64	130.95	-475.32	252.26	12
2003	26	-9.65	89.23	-301.30	118.52	15
2004	26	-67.58	330.40	-1665.30	133.71	14
2005	26	309.66	538.58	-163.88	1645.80	20
2006	26	0.78	187.91	-631.91	482.75	15
2007	26	94.29	155.24	-187.04	389.02	19
2008	26	167.74	896.64	-2382.66	3728.94	19
2009	26	169.64	389.85	-90.37	1854.29	19
2010	26	42.63	169.81	-415.37	367.32	12
2011	26	74.78	319.74	-372.61	1352.59	12
2012	26	41.25	226.77	-460.86	920.17	17
Mean		26.89	178.32	-412.93	511.93	13

Source: Swiss cantons accounts and own calculations

D - Reported and corrected operating revenues

Table 24: Reported and Corrected operating revenues per capita (1980 - 2012)

Canton	Reported Revenues - $Revenue_R$				Corrected Revenues - $Revenue_C$			
	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max
ZH	9'045.51	871.68	7'020.18	10'675.16	8'970.71	869.14	7'015.12	10'617.21
BS	22'755.85	3'034.10	18'722.95	29'273.70	22'602.96	3'095.40	18'719.43	29'267.98
GE	16'012.02	2'554.87	13'008.33	20'152.60	16'000.42	2'554.95	12'991.63	20'134.41
GR	11'683.78	1'647.01	9'850.70	15'725.78	11'590.72	1'676.94	9'608.01	15'577.95
FR	10'189.06	1'477.39	8'286.58	13'711.04	10'073.07	1'438.47	8'230.65	13'591.71
GL	9'123.04	2'179.79	5'983.25	15'085.44	8'970.96	2'045.11	5'983.25	14'675.27
UR	8'821.18	1'392.43	5'905.92	12'272.16	8'704.24	1'396.47	5'858.16	12'214.75
VD	8'734.66	1'829.38	5'838.12	11'978.97	8'677.11	1'850.30	5'788.37	11'914.85
ZG	8'686.35	2'039.63	5'355.79	12'365.77	8'147.04	2'308.27	5'228.27	12'336.64
SG	8'556.28	712.37	7'361.40	10'253.23	8'384.08	669.42	7'243.18	10'237.71
BL	8'426.81	1'613.74	5'977.19	12'172.02	8'377.09	1'556.25	5'960.94	11'851.03
BE	8'377.58	1'423.33	5'747.69	10'444.00	8'291.74	1'378.42	5'747.69	10'188.56
JU	8'343.99	2'414.60	4'806.99	14'056.13	8'243.76	2'392.96	4'753.80	13'965.04
NE	8'331.56	2'248.55	4'830.26	12'789.52	8'262.50	2'199.84	4'828.08	12'736.37
LU	8'070.36	1'638.98	5'790.33	12'384.59	8'033.35	1'634.52	5'757.87	12'311.53
TI	7'970.08	1'068.59	5'727.58	10'280.95	7'960.26	1'068.70	5'720.33	10'277.57
AG	7'342.88	1'205.59	5'917.79	10'677.44	7'041.81	838.76	5'852.84	9'058.99
VS	7'327.64	1'742.29	5'144.99	12'509.48	7'246.68	1'674.35	5'137.55	12'313.86
OW	7'043.34	1'738.83	4'813.84	12'639.72	7'011.40	1'676.30	4'804.34	12'637.03
SH	7'029.16	1'320.48	5'172.64	9'717.37	6'985.30	1'279.86	5'167.14	9'576.56
NW	6'980.02	1'105.72	4'859.77	8'931.54	6'956.08	1'116.80	4'821.90	8'919.01
AI	6'649.27	1'810.92	4'187.85	9'534.71	6'577.96	1'747.75	4'187.85	9'435.27
SZ	6'161.66	1'122.46	4'722.11	7'941.01	6'148.00	1'126.05	4'701.33	7'940.21
SO	6'122.26	1'048.15	4'388.23	8'574.58	6'055.81	1'036.89	4'284.86	8'553.26
AR	6'046.46	1'737.49	4'059.35	9'835.98	6'023.90	1'719.98	4'050.66	9'823.41
TG	5'917.26	873.84	4'610.01	8'089.03	5'880.26	869.34	4'601.55	8'061.04
Mean	8'828.10	1'639.22	6'442.79	12'455.87	8'729.86	1'614.08	6'401.19	12'304.00

Source: Swiss cantons' statement of financial performance and own calculations

E - Reported and corrected operating expenses

Table 25: Reported and Corrected operating expenses per capita (1980 - 2012)

	Reported Expenses - $Expense_R$				Corrected Expenses - $Expense_C$			
Canton	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max
BS	22'005.75	2'714.28	18'376.34	27'185.41	21'768.94	2'618.81	18'338.44	26'827.97
GE	16'337.66	2'167.85	12'420.47	20'743.92	16'229.24	2'076.28	12'328.19	19'798.16
GR	11'471.51	1'456.91	9'831.86	15'278.52	11'135.49	1'180.32	9'494.18	13'183.80
FR	9'921.99	1'130.41	8'253.28	12'017.22	9'711.71	1'001.86	8'193.69	11'776.33
GL	9'081.74	2'137.15	5'964.57	15'048.14	8'668.03	1'605.69	5'964.57	10'979.53
ZH	9'047.86	913.73	6'806.22	11'027.82	8'955.39	896.33	6'658.67	10'977.09
VD	8'866.14	1'689.59	5'827.42	11'970.18	8'743.40	1'737.92	5'687.42	11'892.70
UR	8'679.57	1'280.96	5'891.95	12'380.48	7'987.65	1'382.77	5'556.75	10'531.10
BE	8'543.44	1'250.96	5'741.37	10'634.33	8'316.95	1'230.79	5'732.82	10'484.90
NE	8'498.20	2'255.67	4'957.40	13'292.77	8'401.64	2'210.97	4'854.14	12'870.10
SG	8'430.08	699.68	7'366.06	10'033.67	8'239.95	525.76	7'295.54	9'079.09
BL	8'364.62	1'706.10	6'032.65	12'046.66	8'090.50	1'430.10	6'022.83	10'269.50
JU	8'321.39	2'246.37	4'744.69	11'964.91	8'274.28	2'267.45	4'507.06	11'833.31
ZG	8'203.43	1'946.80	5'140.86	11'770.03	7'470.32	2'093.81	4'891.27	11'279.21
TI	7'943.57	1'172.53	6'061.35	10'108.22	7'841.31	1'133.36	6'032.05	9'757.96
LU	7'902.17	1'306.48	5'611.31	9'805.32	7'818.12	1'262.50	5'563.57	9'693.16
AG	7'184.86	1'083.65	6'065.26	10'649.35	6'899.77	973.48	5'982.30	10'140.42
VS	7'183.84	1'388.37	5'094.55	9'694.20	6'947.40	1'182.67	5'063.30	9'351.15
SH	6'947.02	1'169.44	5'165.63	8'540.29	6'785.84	1'120.43	4'995.92	8'324.37
NW	6'928.73	1'053.90	4'844.75	8'558.60	6'624.77	970.45	4'705.11	8'531.32
OW	6'900.19	1'318.45	4'804.37	8'870.70	6'623.21	1'229.00	4'420.30	7'941.37
AI	6'598.66	1'816.29	4'134.26	9'477.89	6'337.72	1'684.95	3'807.49	8'999.33
SO	6'261.83	1'064.84	4'467.05	7'852.46	6'131.74	1'064.32	4'397.48	7'742.55
AR	6'031.99	1'695.91	3'996.48	9'544.13	5'910.55	1'595.44	3'771.27	8'545.86
SZ	5'997.77	1'272.90	4'417.86	8'573.86	5'843.30	1'196.88	4'290.88	8'295.20
TG	5'856.57	899.93	4'375.38	8'124.45	5'754.11	807.97	4'361.99	7'520.71
Mean	8'750.41	1'493.81	6'399.75	11'738.21	8'519.67	1'403.09	6'266.05	11'024.08

Source: Swiss cantons' statement of financial performance and own calculations

F - Reported and corrected SPER-balances

Table 26: Reported and corrected balances of the statement of financial performance in real terms per capita (1980 - 2012)

	Reported SPER-balance - $Balance_R$					Corrected SPER-balance - $Balance_C$				
Canton	Mean	Std. dev.	Min	Max	Deficits	Mean	Std. dev.	Min	Max	Deficits
BS	750.10	729.93	-494.68	2'088.29	3	449.29	1'253.07	-3'158.80	2'049.49	4
ZG	482.92	465.74	-159.12	1'656.85	2	635.16	603.94	-127.05	2'376.23	2
FR	267.07	837.94	-131.33	3'478.55	5	178.95	249.27	-215.83	636.39	5
GR	212.27	567.05	-796.02	1'955.26	10	384.69	602.94	-419.63	2'206.24	7
OW	169.49	727.38	-224.40	3'769.02	9	244.01	246.63	-217.16	889.40	5
LU	168.19	559.61	-377.19	2'610.08	11	121.27	286.77	-378.84	687.97	9
SZ	163.89	418.63	-632.85	1'003.66	7	242.29	400.09	-481.26	1'108.74	7
AG	158.02	479.38	-147.46	1'975.91	5	157.80	939.03	-3'042.75	1'946.38	4
VS	143.81	849.69	-473.06	4'515.67	10	181.35	355.46	-418.04	844.88	8
UR	141.61	318.42	-286.11	1'133.23	7	619.09	654.49	-305.10	1'732.78	9
SG	126.20	214.40	-273.88	660.27	5	57.62	306.45	-505.91	638.41	5
SH	82.14	329.37	-383.49	1'346.55	9	149.18	264.69	-413.22	769.25	7
BL	62.19	234.82	-264.08	695.12	13	202.64	302.14	-258.44	824.95	12
TG	60.69	176.71	-229.45	368.81	10	64.85	201.00	-262.65	429.81	10
NW	51.28	137.52	-231.13	511.46	5	263.32	338.79	-240.31	1'181.75	6
AI	50.61	60.44	-36.94	192.74	1	240.24	198.39	-79.32	802.81	1
GL	41.30	378.60	-552.57	1'924.53	5	169.92	540.23	-823.84	1'917.30	6
TI	26.51	440.05	-967.27	916.17	13	35.56	478.96	-991.29	1'040.40	14
JU	22.60	591.96	-806.83	3'153.16	13	-149.30	278.78	-901.65	246.74	22
AR	14.47	528.99	-1'182.18	2'553.07	12	66.70	218.80	-362.86	828.99	11
ZH	-2.35	424.44	-1'464.98	1'082.26	13	-26.79	403.08	-1'416.07	633.33	16
VD	-131.48	405.24	-798.81	536.63	17	-67.09	465.31	-872.79	706.70	17
SO	-139.57	681.69	-1'915.52	2'362.39	19	-144.28	486.70	-1'022.17	795.31	19
BE	-165.86	419.48	-1'055.83	300.82	11	-123.60	509.58	-2'203.28	325.25	14
NE	-166.64	185.36	-622.30	89.72	25	-138.23	211.72	-657.21	184.56	25
GE	-325.64	971.45	-1'730.84	1'832.96	14	-277.09	966.13	-1'724.00	1'872.72	14
Mean	87.07	466.70	-624.55	1'642.81	10	136.06	452.40	-826.90	1'064.49	10

Source: Swiss cantons' statement of financial performance and own calculations

G - Time series presentation of the reported and corrected SPER-balances

Table 27: Time series presentation of reported and corrected SPER-balances in real terms per capita

		Reported SPER-balance - $Balance_R$					Corrected SPER-balance - $Balance_C$				
Year	N	Mean	Std. dev.	Min	Max	Deficits	Mean	Std. dev.	Min	Max	Deficits
1980	9	-16.05	178.07	-440.01	207.97	2	72.88	202.21	-398.16	272.13	1
1981	10	15.57	248.37	-417.05	597.57	3	105.29	256.73	-380.83	594.21	3
1982	13	103.40	343.77	-210.80	1'185.30	5	163.53	389.83	-171.13	1'314.11	5
1983	14	92.83	222.41	-108.49	787.19	3	126.44	197.80	-62.96	706.18	2
1984	15	122.74	202.34	-103.57	628.27	1	146.52	184.40	-54.48	493.40	3
1985	15	147.20	225.52	-152.03	722.71	2	256.61	339.72	-131.87	1'198.00	3
1986	17	186.36	359.50	-510.07	916.17	2	330.26	423.68	-149.74	1'374.49	3
1987	19	180.43	281.64	-81.92	865.36	2	334.59	381.23	-101.55	1'137.33	3
1988	21	142.37	207.83	-115.41	760.86	2	351.89	370.02	-86.27	1'423.51	1
1989	21	148.78	236.11	-275.82	695.12	2	304.56	349.22	-256.14	1'259.84	3
1990	22	-23.59	233.37	-677.49	388.66	8	79.33	355.01	-635.52	948.92	9
1991	22	-207.52	421.44	-1'730.84	441.14	15	-164.61	509.88	-1'724.00	916.67	14
1992	22	-248.86	417.26	-1'455.69	521.15	17	-155.80	544.03	-1'423.65	1'483.78	16
1993	22	-186.19	374.94	-1'464.08	253.82	14	-79.74	472.53	-1'419.04	1'235.77	11
1994	22	-240.17	520.99	-1'915.52	275.42	10	-90.73	480.86	-1'193.96	1'000.36	10
1995	24	-106.56	380.56	-1'132.66	466.06	11	57.26	539.36	-1'097.17	1'724.96	11
1996	25	-163.57	359.59	-1'305.61	443.56	16	-73.06	406.13	-1'279.01	673.63	14
1997	26	-211.95	401.89	-1'623.55	325.41	18	-154.67	463.08	-1'584.74	572.34	19
1998	26	-1.95	443.67	-1'022.10	1'366.90	14	35.17	427.74	-988.33	812.23	11
1999	26	73.14	272.45	-633.62	739.43	7	97.78	341.18	-824.25	1'108.74	8
2000	26	103.71	383.50	-731.85	1'403.49	6	238.46	528.28	-746.87	1'772.15	7
2001	26	21.48	209.17	-627.99	523.42	8	99.20	262.72	-627.14	598.66	8
2002	26	-92.22	228.18	-614.81	247.37	12	-64.70	306.41	-823.84	590.81	14
2003	26	-192.88	361.81	-1'149.44	493.54	18	-139.26	412.54	-1'132.42	696.34	15
2004	26	64.36	970.33	-967.27	4'515.67	13	-143.06	729.05	-3'042.75	769.25	13
2005	26	980.83	1307.54	-1'047.55	3'769.02	5	18.94	701.61	-2'203.28	824.95	10
2006	26	308.99	590.72	-1'182.18	1'955.26	3	470.90	650.62	-901.65	2'206.24	3
2007	26	379.01	622.77	-647.54	2'088.29	3	424.25	942.17	-3'158.80	2'376.23	5
2008	26	322.03	310.47	1.72	1'108.81	0	635.14	465.40	-42.52	1'865.59	1
2009	26	257.50	419.12	-205.47	1'633.09	3	505.87	526.89	-176.90	1'917.30	3
2010	26	196.18	346.52	-292.02	1'494.00	5	311.44	416.69	-280.78	1'793.46	7
2011	26	56.72	533.90	-1'464.98	1'729.69	9	190.02	598.96	-1'416.07	2'049.49	9
2012	26	-33.25	565.66	-992.84	1'975.91	15	40.09	609.58	-992.84	1'946.38	14
Mean		66.03	399.44	-766.62	1'076.53	8	132.28	437.97	-874.18	1'150.37	8

Source: Swiss cantons accounts and own calculations

H - Reported and corrected SPER-surpluses

Table 28: Reported and corrected surpluses of the statement of financial performance in real terms per capita (1980 - 2012)

	Reported SPER-surpluses					Corrected SPER-surpluses				
Canton	Mean	Std. Dev.	Min	Max	Surpluses	Mean	Std. Dev.	Min	Max	Surpluses
NE	43.72	33.38	0.55	89.72	8	124.76	69.71	2.17	214.10	7
BE	145.00	106.47	6.32	300.82	15	217.22	105.86	14.87	354.89	13
AR	183.47	547.35	2.52	2'553.07	21	238.06	527.03	4.38	2'544.99	22
AI	53.34	59.30	1.81	192.74	32	250.22	192.95	17.46	802.81	32
TG	156.99	119.94	3.69	368.81	21	265.28	411.86	6.44	1'968.83	21
JU	193.69	697.80	0.67	3'153.16	20	323.37	880.36	3.00	3'105.43	12
ZH	244.13	249.47	11.22	1'082.26	18	331.18	298.74	2.17	1'225.03	16
SH	217.83	354.42	3.26	1'346.55	14	343.80	396.83	6.80	1'628.87	16
SG	223.09	174.30	11.70	660.27	11	350.58	474.36	31.85	1'688.28	11
VD	216.21	219.71	8.78	536.63	16	355.26	208.35	22.15	706.70	16
NW	79.42	126.08	1.58	511.46	28	426.58	504.01	20.65	2'082.00	27
TI	299.02	285.27	26.04	916.17	20	433.22	402.97	44.42	1'550.05	20
LU	411.79	649.47	54.95	2'610.08	14	439.50	611.40	73.68	2'618.37	16
GL	107.44	360.16	2.20	1'924.53	28	452.33	952.16	7.50	4'416.17	27
SZ	366.31	262.25	22.60	1'003.66	19	473.21	298.30	43.48	1'193.38	20
OW	280.67	876.13	4.42	3'769.02	18	497.55	992.66	33.13	4'851.67	22
BL	203.93	199.87	7.49	695.12	19	498.85	481.72	15.17	2'281.72	21
SO	400.41	657.50	6.31	2'362.39	12	517.16	641.29	20.20	2'444.53	12
AG	260.46	532.77	1.77	1'975.92	13	520.86	624.47	16.99	1'946.38	13
VS	328.54	990.93	1.61	4'515.67	20	537.67	958.93	1.08	4'528.78	21
FR	400.36	976.92	9.73	3'478.55	12	547.01	1'020.36	48.64	3'737.49	12
GE	547.85	536.77	15.22	1'832.96	13	595.38	517.28	41.76	1'872.72	14
ZG	520.02	455.65	2.89	1'656.86	31	727.33	620.62	8.54	2'376.23	31
GR	455.48	597.88	12.60	1'955.26	15	737.17	871.47	2.53	3'199.95	17
BS	947.23	623.52	23.03	2'088.29	15	991.53	748.24	16.51	2'440.01	16
UR	236.54	306.49	6.96	1'133.23	22	1'051.51	592.10	239.30	2'724.11	21
Mean	289.34	466.70	9.61	1'642.81	18	471.02	466.70	28.65	2'250.13	18

Source: Swiss cantons' statement of financial performance and own calculations

I - Reported and corrected SPER-deficits

Table 29: Reported and corrected deficits of the statement of financial performance in real terms per capita (1980 - 2012)

	Reported SPER-deficits					Corrected SPER-deficits				
Canton	Mean	Std. Dev.	Min	Max	Deficits	Mean	Std. Dev.	Min	Max	Deficits
GE	-1'136.74	387.30	-1'730.84	-275.82	14	-1'116.42	399.93	-1'724.00	-256.14	13
AG	-108.33	48.30	-147.46	-43.11	5	-842.88	1'068.69	-2'339.37	-47.43	5
VD	-458.72	220.28	-798.81	-49.72	17	-463.03	222.42	-872.79	-149.74	17
SO	-480.61	439.50	-1'915.52	-2.62	19	-450.51	335.99	-1'022.17	-11.80	19
BS	-235.54	242.04	-494.68	-15.32	3	-426.06	310.46	-645.59	-206.53	2
GL	-329.10	262.73	-552.57	-8.23	5	-369.36	323.60	-823.84	-13.96	6
TI	-392.74	270.84	-967.27	-45.87	13	-364.56	286.51	-991.29	-14.63	13
ZH	-343.64	380.65	-1'464.98	-11.85	13	-321.58	353.14	-1'416.07	-22.18	15
SG	-86.97	117.52	-273.88	-4.66	5	-310.06	184.89	-505.91	-52.35	5
BE	-589.75	285.36	-1'055.83	-115.41	11	-267.64	200.33	-616.81	-1.68	13
SZ	-385.54	204.84	-632.85	-100.66	7	-256.99	201.24	-481.26	-45.45	6
VS	-225.65	160.91	-473.06	-24.73	10	-256.95	156.65	-477.49	-47.77	9
JU	-240.62	199.09	-806.83	-11.09	13	-232.74	253.50	-901.65	-22.86	21
NE	-233.96	161.30	-622.30	-22.92	25	-210.19	183.34	-657.21	-8.12	26
LU	-141.84	120.17	-377.19	-3.09	11	-183.46	124.51	-378.84	-8.46	9
TG	-141.54	71.00	-229.45	-35.41	10	-166.04	86.82	-262.65	-2.95	10
UR	-156.77	86.42	-286.12	-30.70	7	-162.54	104.86	-305.10	-3.19	8
GR	-152.55	234.38	-796.02	-30.71	10	-143.89	129.54	-419.63	-17.53	8
AR	-281.27	345.56	-1'182.18	-12.53	12	-136.09	119.15	-362.86	-26.23	11
SH	-128.93	108.93	-383.49	-15.68	9	-130.47	135.93	-413.22	-9.08	7
BL	-144.97	64.99	-264.08	-55.46	13	-118.64	74.16	-258.44	-37.70	11
ZG	-92.08	94.80	-159.12	-25.05	2	-107.76	27.27	-127.05	-88.47	2
NW	-106.30	86.08	-231.13	-5.89	5	-97.44	90.04	-240.31	-3.11	6
OW	-52.87	70.31	-224.40	-2.31	9	-93.00	70.44	-217.16	-42.62	5
FR	-52.80	53.26	-131.33	-0.69	5	-84.18	77.09	-215.83	-24.09	5
AI	-36.94		-36.94	-36.94	1	-79.32		-79.32	-79.32	1
Mean	-259.11	466.70	-624.55	-37.94	10	-284.30	466.70	-644.46	-47.82	10

Source: Swiss cantons' statement of financial performance and own calculations

J - Creative accounting according to the corrected governments' financial performance

Table 30: Creative accounting according to the corrected governments' financial performance in real terms per capita (1980 - 2012)

Canton	Surpluses	ADC	SF	Canton	Deficits	ADC	SF
UR	1'051.51	786.85	23.08	GE	-1'116.42	0.00	27.19
BS	991.53	0.00	104.46	AG	-842.88	3.04	-775.01
GR	737.17	264.29	119.62	VD	-463.03	8.58	-12.89
ZG	727.33	288.45	-80.24	SO	-450.51	54.16	-24.06
GE	595.38	126.34	35.15	BS	-426.06	0.00	-80.40
FR	547.01	20.86	129.73	GL	-369.36	0.00	-96.02
VS	537.67	126.82	105.06	TI	-364.56	0.01	28.18
AG	520.86	4.41	270.37	ZH	-321.58	0.00	-31.97
SO	517.16	106.48	10.27	SG	-310.06	0.00	-252.44
BL	498.85	140.13	191.28	BE	-267.64	218.98	9.46
OW	497.55	196.63	73.58	SZ	-256.99	182.81	-6.78
SZ	473.21	124.60	5.64	VS	-256.95	0.00	-22.81
GL	452.33	89.46	251.65	JU	-232.74	1.43	-91.26
LU	439.50	74.85	5.26	NE	-210.19	0.00	8.26
TI	433.22	109.42	24.78	LU	-183.46	0.36	-12.10
NW	426.58	325.90	18.38	TG	-166.04	0.40	-29.59
VD	355.26	80.96	58.09	UR	-162.54	8.36	-50.09
SG	350.58	0.00	140.83	GR	-143.89	19.33	-75.89
SH	343.80	107.77	50.10	AR	-136.09	109.90	22.17
ZH	331.18	4.66	59.57	SH	-130.47	0.00	24.63
JU	323.37	56.14	-45.01	BL	-118.64	17.41	2.70
TG	265.28	42.57	67.95	ZG	-107.76	358.66	-388.31
AI	250.22	169.73	28.40	NW	-97.44	0.00	-9.12
AR	238.06	11.83	70.45	OW	-93.00	0.00	-7.98
BE	217.22	40.22	12.62	FR	-84.18	0.00	-40.81
NE	124.76	0.00	98.99	AI	-79.32	81.30	-163.88
Mean	471.02	126.90	70.39	Mean	-284.30	40.95	-78.80

Source: Swiss cantons' statement of financial performance and own calculations

K - Adjustments for the series of operating revenues

In addition to have been adjusted for withdrawal from special funds, operating revenues ("Revenue") also needed to be adjusted for other particular events. First, as previously formulated, 2005 accounts for a particular year for Swiss cantonal governments since they received several billion CHF from the Swiss National Bank subsequently to a public sale of gold reserves. Such high amounts of money being exceptional, adjustments were strongly required in order to ensure the accuracy and the reliability of our results. The following amounts have therefore been subtracted from the operating revenues in each Swiss canton in 2005: ZH (1.5 billion CHF); BE (2.3 billion CHF); LU (804.7 million CHF); UR (95.3 million CHF); SZ (214.5 million CHF); OW (137.3 million CHF); NW (51.6 million CHF); GL (73.1 million CHF); ZG (140.4 million CHF); FR (757 million CHF); SO (475 million CHF); BS (263.6 million CHF); BL (372.6 million CHF); SH (82 million CHF); AR (117.9 million CHF); SG (612 million CHF); GR (436.2 million CHF); AG (841.3 million CHF); TG (428 million CHF); TI (577 million CHF); VD (16.7 million CHF); VS (1.1 billion CHF); NE (425.7 million CHF); GE (539.5 million CHF) and JU (260.4 million CHF). In addition to the money received from the Swiss National Bank, operating revenues have also been adjusted for the following elements. In the canton of Nidwald (NW) where the government enjoyed exceptional operating revenues (32.4 million CHF) in 2002 from the exploitation of administrative assets. In the canton of Glarus (GL), 35 million CHF referring to unusual tax revenues have been subtracted from the total amount of operating revenues. Then, in the canton of Ticino (TI), inheritance tax revenues were especially high in 1988 and 1994. For that reason, each year, operating revenues have been reduced by about 100 million CHF. The canton of Neuchâtel (NE), also had to deal with exceptional inheritance tax revenues in 1990 for an amount of 23.6 million CHF. Moreover, the implementation of the "postnumerando" tax system engendered additional operating revenues (235.6 million CHF) that requires to be taken into account.

L - Adjustments for the series of operating expenses

The data have also been adjusted to take into account exceptional events having occasionally affected the average level of operating expenses ("Expense") during the considered period. In this respect, the canton of Obwald (OW) suffered exceptional operating expenses in 2000 by about 12 million CHF due to bad weather. The same year, the canton of Valais (VS) also bear the cost of the bad weather for an amount of 178 million CHF. Then, unusual high operating expenses (272 million CHF) were reported in 2006 in the canton of Neuchâtel (NE) subsequently to the implementation of the "postnumerando" tax system.

M - Operationalization of the variable "Government"

To construct the variable "Right", we use data provided by the publication "Année politique suisse" and by the Swiss Federal Statistics Office. The latter source of data lists, for each Swiss political party, the number of politicians members of a cantonal government's cabinet. The following cantonal political parties are represented : The Liberals (FDP), the Christian Democratic People's Party (CVP), the Social Democratic Party of Switzerland (SP), the Swiss People Party (SVP), Landesring der Unabhängigen (LdU), Evangelische Volkspartei (EVP), the Liberal Party of Switzerland (PLS), Parti de la liberté (PdL), Swiss Democrats (SD), Partei der Arbeit der Schweiz (PdAS) and other various cantonal parties (Misc.).

The variable "Right" represents the proportion of right-wing parties (EVP, PRD, PLS, DS, SVP and PdL) members of the cantonal government's cabinets. Parties classified as Various are assimilated to other parties that have the closest political ideology. Finally, a value is attributed to each political party according to their political leaning. Ladner 1999 proposes to dedicate the following values to the various cantonal political parties: PdAS (1); SP (2.6); PES (3.2); LdU (5.2); CVP (5.4); EVP (5.9); FDP (6.8); PLS (7.6); DS (7.6); SVP (7.7) and PdL (8.2). That way, the higher the value, the more right-wing a political party is.

Moreover, some other precisions have to be underlined. First of all, the difference between all the members of a government's cabinet and the right-wing members does not constitute the proportion of left-wing parties. Indeed, the LdU and CVP parties occupy the middle of the political spectrum. Furthermore, the classification elaborated by Ladner 1999 presupposes two assumptions: (a) a given political party has the same ideology in all Swiss cantons, even if some differences may effectively existed and (b) the ideology of each party is constant over the considered period.

N - Operationalization of the variables "Referendum" and "Initiative"

To operationalize these two variables, we use indices suggested by Stutzer and Frey 2000. For referendum we use a categorical variable that measures the stringency of referendum. In Switzerland, two types of financial referendum do exist : mandatory and optional. The mandatory referendum occurs automatically whenever a new amount of public spending goes beyond a certain threshold. The optional referendum gives to the citizens a certain amount of time in order to collect a certain amount of signatures required for the referendum to take place. The stringency of the mandatory referendum thus depends only on the financial limit (per capita) and is evaluated on a 6 point scale (1 is a high barrier, 6 is a low one). The stringency of the optional referendum is evaluated on the same scale (1 to 6) for each dimension (financial limit, signature, time span). The three resulting indices are aggregated using a simple average. The variable **Referendum** is the maximum of the index for the mandatory referendum and the composite index for the optional referendum. Using the number of signatures required to launch an initiative and the time span within which the signatures have to be collected the index for the stringency level of the variable **Initiative** is constructed in the same way as optional referendum.

O - Qualitative analysis of creative accounting in Swiss cantons

The plan of interviews distributed to the 9 experts, as well as the questionnaire sent to the 26 cantonal administrations of finance are presented in their initial form on the following pages.

Plan of interviews

An investigation of additional depreciation charges and special funds in Swiss cantons

Maxime Clémenceau
Lausanne
May 2013

Questions related to the additional depreciation charges

1. To the best of your knowledge, why do Swiss cantons resort to additional depreciation charges?

2. Have there been any changes over time in the use of additional depreciation charges by Swiss cantons?

3. In your point of view, do Swiss cantons differ in their use of additional depreciation charges?

4. Does the use of additional depreciation charges differ depending on whether it is a financially good or bad year?

5. In some cantons we have noticed that the amounts forecasted as additional depreciation charges differ substantially from those finally recorded when the books are closed. Have you already come across this phenomenon? Why do Swiss cantons would resort to such a practice?

6. Is there a rule defining how Swiss cantons should use additional depreciation charges?

7. Some cantons that do not use additional depreciation charges tend to underestimate the amounts budgeted as ordinary depreciation charges. To the best of your knowledge, can there be an economic reality behind such a practice? Or would it be only an account manipulation?

Questions related to the special funds

1. In your point of view, what is the use of special funds by Swiss cantons?

2. Have there been any changes over time in the use of special funds by Swiss cantons?

3. In your point of view, do Swiss cantons differ in their use of special funds?

4. In your point of view, does the use of special funds differ depending on whether it is a financially good or bad year?

5. In some cantons we have noticed that the amounts forecasted as allocation to special funds differ substantially from those finally recorded when the books are closed. Have you already come across this phenomenon? Why do Swiss cantons would resort to such a practice?

6. It is indicated in the HAM1 that special funds should be based on a legal basis, which determines the amounts to be allocated and withdrawed. However, this does not seem to be the case in reality. Thus, which are in your point of view the criteria determining the amounts allocated and withdrawed from special funds?

Questions related to fiscal balance

1. In your point of view, do these accruals have an effective impact on the cantonal financial situation? Do they change the level of surpluses and deficits? In short-term or long-run?

Divers questions

1. Swiss cantons seem to use additional depreciation charges and special funds randomly. In the end, are there any particular reasons that influence the preference of a canton to one means rather than another?

2. What could be the reasons having determined the introduction of the HAM1 in 1980?

3. To you knowledge, when does the finance minister intervene as regards the recognition of the additional depreciation charges and special funds?

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Questions à l'attention du canton du Valais

Utilisation des amortissements supplémentaires et des financements spéciaux

Maxime Clémenceau
Lausanne
Mai 2013

Questions relatives aux amortissements ordinaires

1. Quelle est la méthode d'amortissement utilisée par le canton du Valais ?

2. Le graphique ci-dessous montre parfois de grandes différences (positives ou négatives) entre les montants prévus au budget et ceux comptabilisés. Quelles peuvent en être les raisons ?
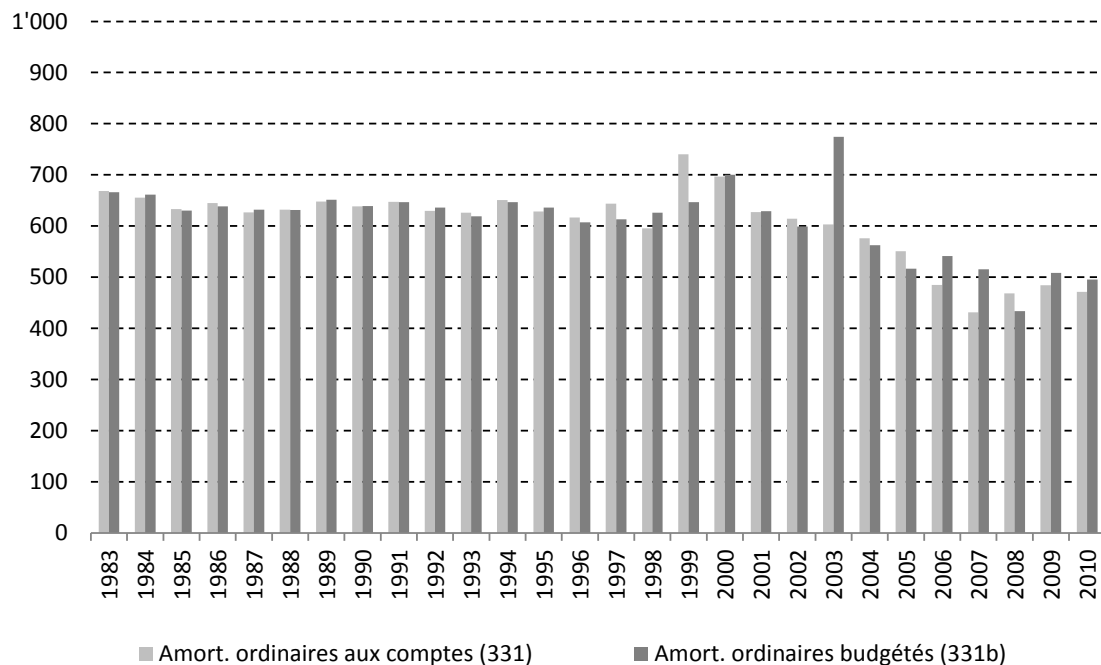
■ Amort. ordinaires aux comptes (331)   ■ Amort. ordinaires budgétés (331b)

Source : Comptes cantonaux et propres calculs.

Les montants en francs sont exprimés en termes réels par habitant.

Questions relatives aux amortissements supplémentaires

1. A quoi servent les amortissements supplémentaires dans le canton du Valais ? Pour quelle(s) raison(s) sont-ils comptabilisés?

2. Y a-t-il des critères déterminant les montants devant être comptabilisés en tant qu'amortissements supplémentaires ? Si oui, lesquels ?

3. Comment se fait-il que les amortissements supplémentaires n'aient pas été utilisés avant 2003 ? Y a-t-il eu un changement dans la pratique de ces écritures comptables au fil du temps ?

4. Comment se fait-il que les amortissements supplémentaires comptabilisés ne soient pas toujours prévus au budget ou qu'ils soient supérieurs au montant prévu au budget ? Les montants inscrits au compte sont d'ailleurs largement supérieurs au budget entre 2007 et 2010.
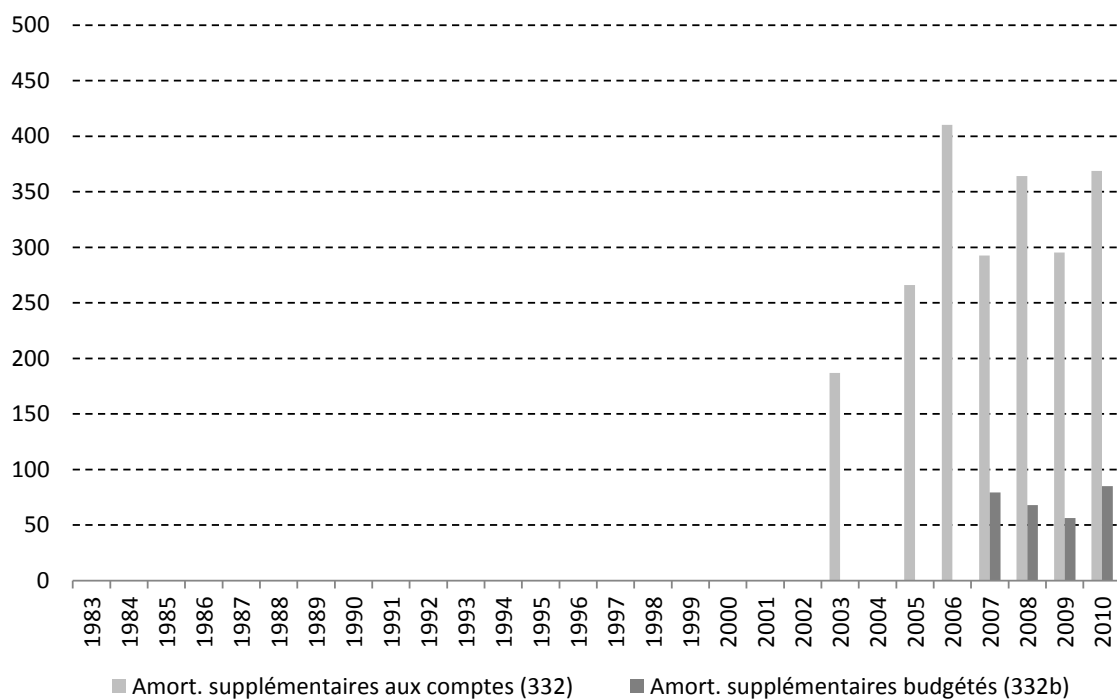
Amort. supplémentaires aux comptes (332) Amort. supplémentaires budgétés (332b)

Source : Comptes cantonaux et propres calculs.
Les montants en francs sont exprimés en termes réels par habitant.

Questions relatives aux financements spéciaux

1. A quoi servent les financements spéciaux dans le canton du Valais ? Pour quelle(s) raison(s) sont-ils comptabilisés?

2. Il est indiqué dans le MCH1 que les financements spéciaux reposent sur une base légale qui fixe les attributions et les prélèvements selon des critères clairs, identiques pour le budget et les comptes. Y a-t-il, à votre connaissance, une règle dans le canton du Valais régissant l'utilisation des financements spéciaux ? Par exemple, quand doivent-ils être utilisés ? Comment sont déterminés les montants devant être comptabilisés en tant qu'attributions aux financements spéciaux ?

3. Les montants attribués aux financements spéciaux sont, à l'exception de 1986, chaque année supérieurs aux montants budgétés. Pourquoi ? Cette différence est particulièrement importante et représente parfois plus dizaines de millions de francs. En 2008 et 2009, cette différence est respectivement de 82.9 et 75.3 millions. Sauriez-vous nous dire ce qu'il s'est passé ces années-là ?

4. Le graphique ci-dessous indique que les montants alloués aux financements spéciaux varient fortement d'une année à l'autre. Ils augmentent d'ailleurs fortement dès 2000. Quelles peuvent en être les raisons ? Y a-t-il une réalité économique derrière ce phénomène ?
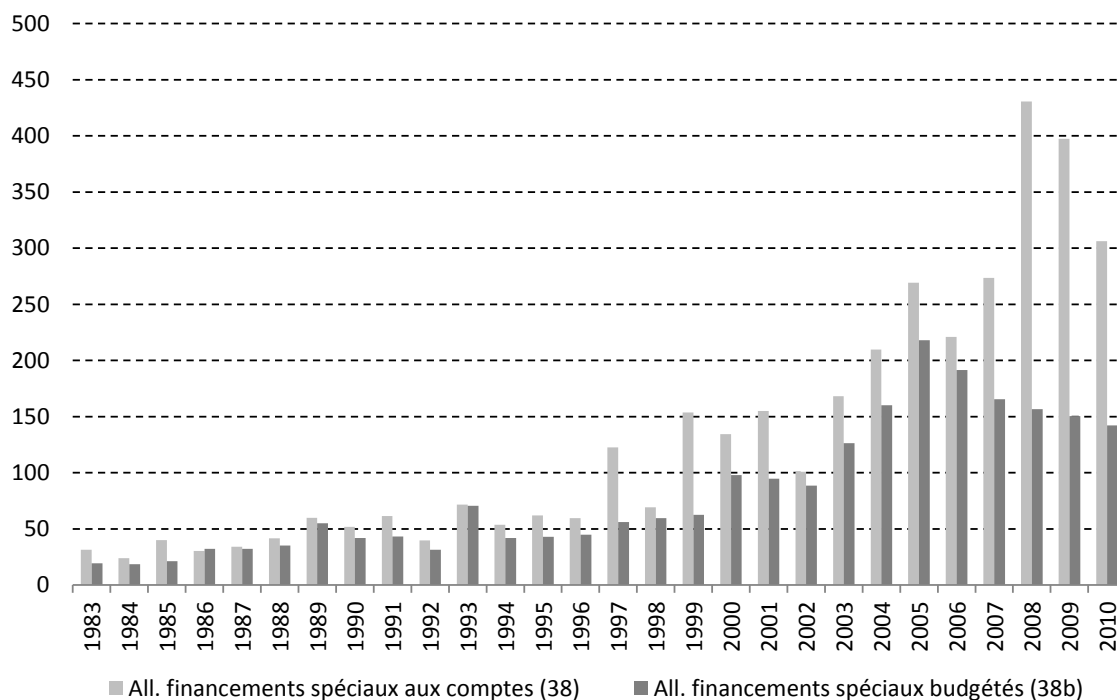
Source : Comptes cantonaux et propres calculs.
Les montants en francs sont exprimés en termes réels par habitant.

Question relative aux soldes publics

1. A votre connaissance, il y a-t-il une relation entre l'utilisation des amortissements supplémentaires (des financements spéciaux) et le niveau des soldes publics ? En d'autres termes, selon vous, est-ce que l'utilisation des amortissements supplémentaires (des financements spéciaux) varie selon que le canton se trouve dans une bonne ou une mauvaise situation financière ?

2. A quel moment le Directeur des finances (Conseiller d'Etat en charges des finances) intervient s'agissant de la mise au budget des amortissements supplémentaires ou des opérations sur financements spéciaux.

3. L'utilisation des amortissements supplémentaires et des opérations sur financements spéciaux a-t-elle eu un impact sur la situation financière de votre canton ? Si oui, cet impact a-t-il été positif ou négatif ?

P - Quantitative impact of creative accounting on the governments' financial performance

Endogenous covariates

Table 31: Covariance between the potentially endogenous covariates and the instruments

Variables	Error	Referendum	Initiative	Rule
Instrument	Error(D1)	Referendum(-2)	Initiative(-2)	Rule(-2)
Covariance	0.5353	0.9116	0.9527	0.8665

(-2) denotes the second lag value of the variable whereas (D1) refers to the first difference of the variable

Table 32: Validity of the instruments (2SLS First stage F-stat)

Variables	Error	Referendum	Initiative	Rule
Instrument	Error(D1)	Referendum(-2)	Initiative(-2)	Rule(-2)
F-stat	98.82	154.83	116.19	208.93
p-value	0.000	0.000	0.000	0.000

(-2) denotes the second lag value of the variable whereas (D1) refers to the first difference of the variable. F-stat higher than 16.85 reveals a valid instrument (Stock and Yogo 2005)

Heteroskedasticity

Table 33: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

	Chi2	P-value
Balance	125.430	0.000
Revenue	291.440	0.000
Expense	625.790	0.000

H0: No heteroskedasticity

Autocorrelation

Table 34: Wooldridge test for autocorrelation of order one

	F-stat	p-value
Balance	19.890	0.000
Revenue	13.277	0.001
Expense	4.665	0.041

H0: No autocorrelation of order one

Table 35: Arellano-Bond test for autocorrelation of order one and two

| | AR(1) | | AR(2) | |
	F-stat	p-value	z-stat	p-value
Balance	-1.660	0.097	0.510	0.612
Revenue	3.150	0.002	2.280	0.023
Expense	3.470	0.001	1.310	0.191

AR(1) refers to autocorrelation of order one whereas AR(2) denotes autocorrelation of order two. H0: No autocorrelation

Fixed effects

Table 36: Breusch and Pagan Lagrangian multiplier test for random effects

	Chi2	p-value
Balance	0.290	0.591
Revenue	13.860	0.000
Expense	6.500	0.011

H0: RE not necessarily appropriate

Table 37: Hausman test for random versus fixed effects

	Chi2	p-value
Balance	20.440	0.117
Revenue	30.780	0.004
Expense	52.410	0.000

H0: Difference in coefficients not systematic

Multicolinearity

Table 38: Variance inflation factor (VIF) for the regressors

	FE		without FE	
Variables	VIF	1/VIF	VIF	1/VIF
Initiative	38.81	0.025765	1.89	0.528224
Referendum	8.75	0.114334	1.86	0.538263
Elderly	5.51	0.181346	1.13	0.886855
Coalition	4.83	0.207053	1.25	0.79742
Rule	4.05	0.247036	1.19	0.842708
Departments	3.56	0.280534	1.37	0.72993
Government	2.62	0.380958	1.29	0.774099
Unemployment	2.20	0.455558	1.64	0.608975
Creative * Rule	1.61	0.622351	1.50	0.665712
SF(-1)	1.60	0.625877	1.48	0.677398
Balance(-1)	1.58	0.631569	1.40	0.713486
Concordance	1.50	0.668767	1.19	0.843851
ADC(-1)	1.47	0.681252	1.18	0.847579
Error	1.29	0.774596	1.12	0.889085
Growth	1.12	0.894043	1.10	0.911504
Election	1.05	0.956822	1.03	0.973645
Mean VIF	4.68		1.35	

Multicolinearity may be an issue when the VIF is equal or higher than 10.

Robustness checks

Table 39: Results of the single equation model in cases of surpluses and deficits with Tobit estimation

	Surplus	Deficit
ADC(-1)	0.304***	0.290**
	(0.066)	(0.134)
SF(-1)	0.059	0.117
	(0.056)	(0.203)
Surplus(-1)	0.474***	
	(0.046)	
Deficit(-1)		0.288***
		(0..072)
Error	-0.436***	-0.296***
	(0.069)	(0.112)
Growth	14.149	41.546***
	(9.611)	(12.772)
Unemployment	4.149	-0.158
	(15.490)	(11.281)
Elderly	1.929	-25.481
	(7.562)	(16.656)
Government	-87.505**	-65.026
	(37.908)	(44.709)
Coalition	39.818**	-70.172*
	(18.741)	(40.383)
Concordance	22.748	184.586
	(104.264)	(232.767)
Departments	0.978	7.295
	(8.252)	(11.512)
Election	26.195	-15.265
	(35.255)	(35.828)
Initiative	46.143**	62.492
	(20.056)	(43.052)
Referendum	6.367	-9.846
	(17.743)	(33.417)
Rules	7.816	7.508
	(20.170)	(37.417)
Creative * Rules	0.031	-0.119
	(0.041)	(0.110)
Constant	112.408	224.054
	(264.247)	(462.052)
Cantonal fixed effects	NO	NO
Log Likelihood	-2679.945	-1161.919
Joint	393.730	60.590
p-value	0.000	0.000
N	377	170

Table 40: Results of the simultaneous equations model with variables of interest in "Expense"

	Revenue	Expense
ADC(-1)		-0.256***
		(0.068)
SF(-1)		0.011
		(0.071)
Revenue(-1)	0.442***	
	(0.037)	
Expense(-1)		0.548***
		(0.056)
Revenue		0.335***
		(0.063)
Expense	0.533***	
	(0.047)	
Error		-0.483***
		(0.139)
Growth	29.310***	-16.621*
	(9.239)	(9.839)
Unemployment	-13.824	64.140***
	(13.684)	(13.622)
Elderly	6.081	62.752***
	(18.466)	(18.971)
Government	-137.664***	112.388**
	(45.114)	(47.683)
Coalition	31.589	55.551
	(35.200)	(37.064)
Concordance	-24.773	-247.543*
	(123.639)	(129.713)
Departments	-0.630	1.816
	(12.274)	(12.854)
Election	-8.866	10.571
	(32.298)	(33.734)
Initiative	89.814	-146.107
	(144.414)	(149.972)
Referendum	-15.094	55.430
	(60.581)	(63.442)
Rule	23.734	37.353
	(47.148)	(50.470)
Creative * Rule	0.075*	-0.060
	(0.041)	(0.051)
Constant	477.401	-337.159
	(646.084)	(674.905)
Cantonal FE	YES	YES
R-Squared	98.670	98.610
F-stat / Chi2	54381.360	50493.880
p-value	0.000	0.000
N	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 41: Results of the simultaneous equations model with variables of interest in "Revenue"

	Revenue	Expense
ADC(-1)	0.208***	
	(0.066)	
SF(-1)	0.112*	
	(0.063)	
Revenue(-1)	0.380***	
	(0.040)	
Expense(-1)		0.582***
		(0.053)
Revenue		0.298***
		(0.059)
Expense	0.610***	
	(0.050)	
Error		-0.531***
		(0.138)
Growth	27.930***	-18.329*
	(9.082)	(10.158)
Unemployment	-25.021*	61.497***
	(13.703)	(13.998)
Elderly	-3.701	62.346***
	(18.285)	(19.571)
Government	-147.281***	109.931**
	(44.338)	(49.119)
Coalition	21.090	48.673
	(34.806)	(38.026)
Concordance	13.473	-228.509*
	(122.028)	(133.453)
Departments	0.845	1.799
	(12.056)	(13.273)
Election	-11.404	10.424
	(31.709)	(34.849)
Initiative	96.455	-160.569
	(141.791)	(154.574)
Referendum	-7.931	63.997
	(59.625)	(65.028)
Rule	35.551	48.037
	(47.027)	(50.602)
Creative * Rule	0.014	-0.088
	(0.047)	(0.044)
Constant	510.691	-251.087
	(634.558)	(695.946)
Cantonal FE	YES	YES
R-Squared	98.720	95.820
F-stat / Chi2	56537.300	47264.170
p-value	0.000	0.000
N	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 42: Results of the single equation model without the variable "Error"

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.331***	0.333***	0.364***	0.325***	0.368***
	(0081)	(0.075)	(0.083)	(0.075)	(0.078)
SF(-1)	0.082	0.095	0.034	0.060	0.081
	(0.115)	(0.076)	(0.116)	(0.118)	(0.072)
Balance(-1)	0.395***	0.296***	0.381***	0.407***	0.453
	(0.096)	(0.039)	(0.079)	(0.094)	(0.089)
Error					
Growth	30.656***	28.537***	27.384*	30.156***	30.412***
	(10.140)	(10.786)	(14.690)	(9.910)	(9.427)
Unemployment	-36.037**	-44.038***	-41.264**	-34.747**	-33.439***
	(13.571)	(15.121)	(17.096)	(14.014)	(10.713)
Elderly	-11.975	-8.312	-3.902	-2.899	-4.568
	(15.172)	(20.199)	(17.371)	(17.183)	(7.834)
Government	-169.095***	-180.469***	-110.669**	-190.811***	-105.811**
	(46.931)	(54.367)	(49.752)	(48.106)	(43.945)
Coalition	19.505	16.214	38.016	19.228	31.839*
	(32.157)	(41.602)	(24.474)	(36.263)	(16.310)
Concordance	19.140	15.087	65.526	33.274	86.140
	(80.830)	(143.709)	(122.478)	(73.705)	(100.465)
Departments	-5.493	-3.432	-4.213	-12.161*	-3.437
	(6.052)	(14.462)	(7.817)	(6.264)	(5.352)
Election	-8.936	-6.935	-3.902	-8.788	-5.583
	(36.797)	(35.947)	(17.371)	(36.251)	(35.118)
Initiative	120.281*	142.113	68.878**	-4.012	61.288***
	(67.608)	(96.052)	(27.787)	(134.169)	(19.706)
Referendum	-32.156	-36.446	-16.676	-54.926	-14.470
	(22.709)	(43.657)	(20.025)	(38.435)	(14.244)
Rule	55.069	72.204*	3.816	12.494	7.777
	(49.770)	(41.379)	(22.459)	(54.469)	(25.244)
Creative * Rule	0.029	0.024	0.057	0.057	0.013
	(0.054)	(0.055)	(0.082)	(0.057)	(0.022)
Constant	695.585*	522.736	350.868	1391.367*	325.290
	(361.373)	(552.215)	(320.986)	(841.356)	(247.247)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	38.480	35.770	33.640	30.360	-
F-stat / Chi2	31.380	13.180	237.810	412.900	1315.790
p-value	0.000	0.000	0.000	0.000	0.000
N	712	686	712	712	686

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 43: Results of the simultaneous equations model without the variable "Error"

	Revenue	Expense
ADC(-1)	0.013	-0.300***
	(0.187)	(0.085)
SF(-1)	0.007	-0.040
	(0.161)	(0.085)
Revenue(-1)	0.756***	
	(0.149)	
Expense(-1)		0.323***
		(0.040)
Revenue		0.413***
		(0.062)
Expense	-0.219	
	(0.267)	
Error		
Growth	-4.349	-26.191**
	(21.615)	(11.987)
Unemployment	169.044***	126.610***
	(63.190)	(16.130)
Elderly	249.964***	146.909***
	(73.680)	(26.290)
Government	-86.647	112.190*
	(112.028)	(59.787)
Coalition	213.735**	107.864**
	(104.402)	(48.176)
Concordance	-826.062**	-516.794***
	(370.748)	(169.899)
Departments	-20.525	-7.865
	(29.334)	(16.408)
Election	78.330	45.713
	(77.742)	(42.124)
Initiative	16.030	-123.601
	(393.418)	(223.439)
Referendum	-87.201	1.326
	(172.024)	(91.443)
Rule	207.178*	101.610
	(111.777)	(62.308)
Creative * Rule	-0.092	-0.085
	(0.113)	(0.064)
Constant	643.109	-228.845
	(1676.339)	(925.929)
Cantonal FE	YES	YES
R-Squared	93.440	97.930
F-stat / Chi2	10118.010	31823.420
p-value	0.000	0.000
N	712	712

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 44: Results of the single equation model without insignificant explanatory variables

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.327***	0.328***	0.394***	0.324***	0.380***
	(0.090)	(0.071)	(0.077)	(0.089)	(0.071)
SF(-1)	0.110	0.123**	0.074	0.115	0.056
	(0.072)	(0.062)	(0.104)	(0.072)	(0.080)
Balance(-1)	0.379***	0.284***	0.345***	0.386***	0.441***
	(0.071)	(0.037)	(0.078)	(0.070)	(0.070)
Error	-0.483***	-0.506***	-0.491***	-0.410**	-0.478***
	(0.102)	(0.074)	(0.133)	(0.184)	(0.070)
Growth	23.326**	19.913*	15.931	25.360***	19.733**
	(9.747)	(10.423)	(14.090)	(8.177)	(9.810)
Unemployment	-19.386	-25.332*	-45.719***	-20.714*	-37.386***
	(11.488)	(14.001)	(13.708)	(12.490)	(9.268)
Elderly					
Government	-170.818***	-184.364***	-73.941*	-175.784***	-69.742***
	(43.213)	(49.746)	(41.770)	(47.273)	(31.706)
Coalition					
Concordance					
Departments					
Election					
Initiative					
Referendum					
Rule					
Creative * Rule					
Constant	949.707***	847.726***	483.048*	983.657***	425.098**
	(267.393)	(255.356)	(249.221)	(261.658)	(204.907)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	0.348	0.399	0.347	34.940	-
F-stat / Chi2	60.280	34.930	193.620	400.900	374.640
p-value	0.000	0.000	0.000	0.000	0.000
N	712	686	712	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 45: Results of the simultaneous equations model without insignificant explanatory variables

	Revenue	Expense
ADC(-1)	0.264***	-0.262***
	(0.065)	(0.070)
SF(-1)	0.120**	-0.052
	(0.056)	(0.063)
Revenue(-1)	0.398***	
	(0.037)	
Expense(-1)		0.620***
		(0.060)
Revenue		0.329***
		(0.064)
Expense	0.592***	
	(0.041)	
Error		-0.510***
		(0.151)
Growth		
Unemployment		
Elderly		
Government	-161.576***	110.060***
	(41.153)	(45.796)
Coalition		
Concordance		
Departments		
Election		
Initiative		
Referendum		
Rule		
Creative * Rule		
Constant		
Cantonal FE	YES	YES
R-Squared	98.650	98.470
F-stat / Chi2	54218.040	46258.000
p-value	0.000	0.000
N	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 46: Results of the single equation model without UR

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.326***	0.336***	0.383***	0.312***	0.389***
	(0.117)	(0.089)	(0.102)	(0.112)	(0.106)
SF(-1)	0.095	0.114	0.061	0.081	0.093
	(0.102)	(0.074)	(0.116)	(0.107)	(0.066)
Balance(-1)	0.358***	0.275***	0.312***	0.372***	0.400***
	(0.080)	(0.038)	(0.084)	(0.079)	(0.075)
Error	-0.471***	-0.494***	-0.503***	-0.389***	-0.500***
	(0.107)	(0.075)	(0.133)	(0.176)	(0.071)
Growth	20.051**	17.820*	14.157	22.335***	18.288*
	(10.073)	(10.701)	(13.949)	(8.491)	(9.931)
Unemployment	-26.218*	-31.540**	-37.662***	-26.999**	-28.838***
	(13.704)	(14.625)	(15.427)	(14.779)	(10.331)
Elderly	-13.704	-13.093	-9.105	-7.437	-10.761
	(18.022)	(19.460)	(17.919)	(19.594)	(6.549)
Government	-142.731***	-147.695***	-71.920	-156.786***	-63.239**
	(42.155)	(52.105)	(49.740)	(48.383)	(32.539)
Coalition	17.725	18.439	19.311	21.250	12.175
	(30.718)	(39.977)	(23.933)	(32.985)	(15.421)
Concordance	20.636	24.655	91.006	29.982	131.058
	(77.653)	(138.040)	(118.433)	(71.106)	(106.881)
Departments	-8.617	-7.022	-9.827	-9.125	-8.738*
	(6.975)	(13.889)	(8.366)	(5.852)	(5.043)
Election	-9.354	-9.476	-0.841	-10.904	-8.535
	(39.292)	(35.606)	(41.381)	(37.146)	(37.035)
Initiative	57.704	81.138	62.562**	65.931	56.959***
	(62.726)	(93.029)	(26.914)	(88.393)	(16.531)
Referendum	-32.903	-39.835	-10.913	-62.074*	-10.610
	(28.150)	(41.668)	(20.231)	(34.032)	(10.902)
Rule	55.572	71.464*	19.830	10.552	21.932
	(49.908)	(39.426)	(21.955)	(51.952)	(24.883)
Creative * Rule	0.027	0.018	0.042	0.051	0.011
	(0.049)	(0.054)	(0.085)	(0.053)	(0.019)
Constant	842.535**	652.554	266.217	912.548	213.859
	(367.529)	(536.024)	(325.562)	(739.922)	(224.540)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	33.790	28.010	34.030	33.670	-
F-stat / Chi2	63.900	15.030	205.050	398.100	1082.640
p-value	0.000	0.000	0.000	0.000	0.000
N	684	659	684	675	659

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 47: Results of the simultaneous equations model without UR

	Revenue	Expense
ADC(-1)	0.309***	-0.293***
	(0.080)	(0.086)
SF(-1)	0.120*	-0.016
	(0.065)	(0.073)
Revenue(-1)	0.351***	
	(0.041)	
Expense(-1)		0.500***
		(0.059)
Revenue		0.384***
		(0.066)
Expense	0.649***	
	(0.051)	
Error		-0.536***
		(0.141)
Growth	24.876***	-18.468*
	(9.167)	(10.101)
Unemployment	-31.695**	69.202***
	(13.693)	(13.673)
Elderly	-4.832	60.069***
	(18.340)	(19.498)
Government	-149.807***	123.608***
	(43.932)	(48.014)
Coalition	9.397	55.004
	(34.572)	(37.318)
Concordance	43.663	-244.621*
	(121.209)	(131.068)
Departments	-0.643	2.069
	(12.161)	(13.193)
Election	-13.552	22.632
	(31.955)	(34.550)
Initiative	66.800	-142.883
	(143.720)	(154.979)
Referendum	-5.925	55.281
	(58.817)	(63.786)
Rule	36.010	31.176
	(46.542)	(50.870)
Creative * Rule	0.005	-0.050
	(0.048)	(0.052)
Constant	619.827	-400.547
	(632.902)	(685.720)
Cantonal FE	YES	YES
R-Squared	98.790	98.650
F-stat / Chi2	57821.080	49856.110
p-value	0.000	0.000
N	675	675

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 48: Results of the single equation model without GE

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.347***	0.353***	0.413***	0.335***	0.407***
	(0.088)	(0.075)	(0.080)	(0.084)	(0.078)
SF(-1)	0.117	0.130*	0.077	0.105	0.105
	(0.097)	(0.072)	(0.112)	(0.100)	(0.065)
Balance(-1)	0.324***	0.274***	0.287***	0.335***	0.379***
	(0.073)	(0.039)	(0.086)	(0.071)	(0.073)
Error	-0.417***	-0.439***	-0.475***	-0.450***	-0.475***
	(0.135)	(0.086)	(0.169)	(0.223)	(0.089)
Growth	20.673**	18.703*	15.915	20.907**	18.795*
	(9.945)	(10.467)	(13.700)	(8.453)	(9.940)
Unemployment	-32.168***	-37.086**	-35.041***	-30.093**	-27.612***
	(12.434)	(14.628)	(14.717)	(14.814)	(10.407)
Elderly	-18.168	-18.591	-12.079	-12.930	-13.921***
	(18.093)	(18.474)	(16.384)	(19.888)	(5.413)
Government	-132.973***	-133.469***	-72.756	-148.710***	-62.355*
	(46.674)	(53.660)	(51.523)	(50.949)	(33.673)
Coalition	8.706	8.962	24.356	11.049	18.428
	(28.774)	(38.982)	(23.462)	(32.340)	(14.763)
Concordance	-1.624	1.328	25.985	18.508	40.821
	(73.092)	(132.446)	(124.805)	(66.936)	(63.275)
Departments	-6.234	-5.272	-5.028	-8.274	-4.899
	(6.788)	(13.267)	(8.723)	(5.593)	(5.400)
Election	-5.070	-7.797	0.126	-5.931	-8.148
	(38.800)	(35.480)	(38.229)	(37.871)	(37.081)
Initiative	101.547	110.889	59.328**	66.592	48.433***
	(66.307)	(89.003)	(26.497)	(94.067)	(15.452)
Referendum	-38.470	-42.984	-10.214	-52.236	-8.544
	(28.198)	(40.034)	(22.274)	(39.348)	(10.692)
Rule	65.408	78.117	13.075	25.470	13.935
	(51.652)	(38.175)	(22.272)	(53.457)	(25.118)
Creative * Rule	0.017	0.012	0.035	0.039	0.016
	(0.047)	(0.052)	(0.082)	(0.050)	(0.017)
Constant	733.727**	644.428	338.788	959.929	327.445
	(367.702)	(547.410)	(296.019)	(758.001)	(205.735)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	30.220	27.160	32.310	30.240	-
F-stat / Chi2	49.360	14.450	270.850	393.200	2593.630
p-value	0.000	0.000	0.000	0.000	0.000
N	686	661	686	677	661

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 49: Results of the simultaneous equations model without GE

	Revenue	Expense
ADC(-1)	0.314***	-0.320***
	(0.070)	(0.071)
SF(-1)	0.148**	-0.046
	(0.064)	(0.071)
Revenue(-1)	0.305***	
	(0.043)	
Expense(-1)		0.462***
		(0.061)
Revenue		0.428***
		(0.071)
Expense	0.690***	
	(0.052)	
Error		-0.610***
		(0.157)
Growth	25.071***	-17.093*
	(9.076)	(9.659)
Unemployment	-35.919***	81.252***
	(14.086)	(13.851)
Elderly	-9.431	57.043***
	(17.975)	(18.469)
Government	-117.161***	138.873***
	(47.758)	(49.479)
Coalition	-1.975	69.005*
	(34.850)	(37.026)
Concordance	-13.660	-199.039
	(122.323)	(129.036)
Departments	1.987	0.347
	(11.986)	(12.570)
Election	-8.729	10.722
	(31.725)	(33.216)
Initiative	146.389	-179.260
	(142.308)	(146.720)
Referendum	-26.413	62.664
	(59.494)	(61.710)
Rule	56.328	15.917
	(47.450)	(50.583)
Creative * Rule	-0.003	-0.039
	(0.047)	(0.050)
Constant	386.243	-498.934
	(640.518)	(670.120)
Cantonal FE	YES	YES
R-Squared	98.520	98.370
F-stat / Chi2	45610.890	40665.110
p-value	0.000	0.000
N	677	677

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 50: Results of the single equation model without JU

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.312***	0.314***	0.366***	0.304***	0.373***
	(0.086)	(0.074)	(0.081)	(0.081)	(0.077)
SF(-1)	0.085	0.108	0.037	0.077	0.078
	(0.103)	(0.075)	(0.115)	(0.149)	(0.066)
Balance(-1)	0.382***	0.260***	0.342***	0.390***	0.410***
	(0.078)	(0.039)	(0.081)	(0.063)	(0.075)
Error	-0.476***	-0.497***	-0.476***	-0.405***	-0.472***
	(0.105)	(0.077)	(0.130)	(0.172)	(0.070)
Growth	22.142**	18.535*	17.127	24.777***	20.727**
	(10.397)	(11.021)	(14.291)	(8.195)	(10.017)
Unemployment	-21.454	-31.695**	-35.780**	-24.024*	-29.243***
	(13.868)	(15.991)	(15.757)	(12.814)	(10.603)
Elderly	-15.693	-13.746	-7.964	-12.745	-9.814*
	(18.856)	(21.234)	(16.949)	(24.043)	(5.918)
Government	-149.300***	-159.284***	-101.196**	-162.558***	-90.878***
	(44.106)	(56.219)	(49.796)	(53.804)	(29.990)
Coalition	12.374	16.359	17.724	20.672	12.150
	(32.540)	(44.125)	(22.532)	(36.572)	(14.454)
Concordance	55.082	33.732	134.733	49.027	149.494
	(77.578)	(147.186)	(117.853)	(172.920)	(105.912)
Departments	-7.260	-5.332	-10.701	-8.291	-10.543**
	(6.847)	(14.713)	(7.754)	(10.712)	(5.307)
Election	-3.457	-3.589	1.909	-7.030	-4.609
	(40.638)	(35.996)	(41.141)	(35.577)	(38.028)
Initiative	62.030	93.387	74.462**	75.898	67.307***
	(60.393)	(97.462)	(29.265)	(164.828)	(15.966)
Referendum	-32.304	-40.015	-21.267	-55.637	-20.149**
	(27.172)	(43.990)	(21.735)	(54.390)	(8.578)
Rule	58.960	79.763*	11.017	11.588	15.307
	(51.059)	(42.395)	(21.092)	(63.989)	(24.529)
Creative * Rule	0.031	0.020	0.048	0.053	0.006
	(0.050)	(0.054)	(0.082)	(0.068)	(0.019)
Constant	864.438**	618.855	381.122	938.403	354.112
	(359.923)	(552.727)	(315.787)	(834.276)	(225.099)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	42.960	41.270	37.890	43.550	-
F-stat / Chi2	50.690	14.130	281.930	587.570	1554.500
p-value	0.000	0.000	0.000	0.000	0.000
N	679	654	679	671	654

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 51: Results of the simultaneous equations model without JU

	Revenue	Expense
ADC(-1)	0.269***	-0.307***
	(0.068)	(0.069)
SF(-1)	0.111*	-0.011
	(0.065)	(0.072)
Revenue(-1)	0.373***	
	(0.041)	
Expense(-1)		0.499***
		(0.056)
Revenue		0.365***
		(0.063)
Expense	0.627***	
	(0.053)	
Error		-0.528***
		(0.137)
Growth	28.704***	-17.655*
	(9.363)	(10.143)
Unemployment	-28.871**	70.354***
	(14.342)	(14.215)
Elderly	-6.835	56.782***
	(18.450)	(19.175)
Government	-154.222***	142.266***
	(45.938)	(49.145)
Coalition	9.580	97.958***
	(38.608)	(40.703)
Concordance	57.614	-303.623**
	(126.987)	(134.070)
Departments	0.528	-3.535
	(12.204)	(13.007)
Election	-11.611	9.530
	(32.748)	(34.855)
Initiative	66.511	-133.462
	(135.263)	(142.877)
Referendum	1.586	43.879
	(58.262)	(62.250)
Rule	42.463	21.420
	(47.190)	(50.776)
Creative * Rule	0.007	-0.041
	(0.048)	(0.052)
Constant	617.467	-373.341
	(633.364)	(673.762)
Cantonal FE	YES	YES
R-Squared	98.730	98.620
F-stat / Chi2	54671.270	48645.420
p-value	0.000	0.000
N	671	671

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 52: Results of the single equation model without AG

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.306***	0.304***	0.364***	0.296***	0.366***
	(0.081)	(0.069)	(0.076)	(0.093)	(0.075)
SF(-1)	0.134*	0.164**	0.107	0.134	0.116
	(0.077)	(0.073)	(0.117)	(0.103)	(0.070)
Balance(-1)	0.394***	0.290***	0.376***	0.405***	0.438***
	(0.078)	(0.037)	(0.079)	(0.075)	(0.076)
Error	-0.489***	-0.513***	-0.496***	-0.445***	-0.496***
	(0.105)	(0.071)	(0.129)	(0.185)	(0.065)
Growth	25.156***	22.246**	20.292	26.444***	21.563**
	(9.572)	(10.058)	(13.508)	(7.313)	(9.596)
Unemployment	-18.669	-25.688*	-30.810**	-17.987	-24.517***
	(12.350)	(14.163)	(14.385)	(12.619)	(9.537)
Elderly	-21.050	-18.721	-9.890	-16.741	-10.827*
	(15.730)	(18.797)	(16.702)	(22.107)	(6.043)
Government	-125.206***	-133.276***	-72.390	-136.821***	-63.021**
	(37.471)	(50.867)	(46.434)	(42.341)	(31.284)
Coalition	20.751	21.610	11.194	19.636	5.380
	(28.073)	(38.534)	(20.917)	(33.434)	(12.018)
Concordance	7.572	4.119	111.281	26.023	140.235
	(76.196)	(133.661)	(102.311)	(147.783)	(107.169)
Departments	-8.480	-7.049	-7.703	-10.081	-7.826
	(6.475)	(13.393)	(7.839)	(11.266)	(5.219)
Election	6.096	8.375	12.439	5.304	7.817
	(37.819)	(33.026)	(38.623)	(30.134)	(36.318)
Initiative	109.219*	139.966	58.004**	78.798	52.183***
	(56.239)	(89.213)	(24.545)	(111.964)	(15.570)
Referendum	-38.362	-45.718	-8.825	-38.630	-8.233
	(25.564	(40.313)	(19.990)	(57.787)	(9.655)
Rule	6.111	14.687	-0.196	-23.047	3.885
	(24.653)	(40.224)	(18.346)	(52.489)	(18.822)
Creative * Rule	0.014	0.014	0.025	0.038	0.002
	(0.053)	(0.060)	(0.053)	(0.094)	(0.031)
Constant	635.362**	432.704	265.047	787.064	221.734
	(296.239)	(502.949)	(306.928)	(600.543)	(220.555)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	46.750	44.860	42.550	47.110	-
F-stat / Chi2	65.230	17.130	317.880	710.170	1621.420
p-value	0.000	0.000	0.000	0.000	0.000
N	695	670	695	686	670

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 53: Results of the simultaneous equations model without AG

	Revenue	Expense
ADC(-1)	0.260***	-0.286***
	(0.065)	(0.070)
SF(-1)	0.131**	-0.049
	(0.065)	(0.075)
Revenue(-1)	0.381***	
	(0.039)	
Expense(-1)		0.558***
		(0.059)
Revenue		0.317***
		(0.065)
Expense	0.615***	
	(0.048)	
Error		-0.477***
		(0.141)
Growth	30.759***	-17.300*
	(8.777)	(9.992)
Unemployment	-22.948*	63.012***
	(13.193)	(13.749)
Elderly	-10.655	70.088***
	(17.810)	(19.201)
Government	-128.376***	95.258**
	(42.848)	(48.380)
Coalition	12.661	60.697
	(33.440)	(37.230)
Concordance	15.581	-255.364**
	(117.371)	(131.178)
Departments	-0.388	3.148
	(11.548)	(12.930)
Election	-3.632	3.208
	(30.729)	(34.329)
Initiative	116.479	-157.371
	(137.033)	(151.968)
Referendum	-7.567	49.671
	(56.993)	(63.605)
Rule	1.869	68.882
	(48.428)	(53.838)
Creative * Rule	0.012	-0.047
	(0.055)	(0.062)
Constant	411.270	-244.359
	(611.692)	(682.929)
Cantonal FE	YES	YES
R-Squared	98.840	98.660
F-stat / Chi2	61402.020	49731.860
p-value	0.000	0.000
N	686	686

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 54: Results of the single equation model with cantonal and time fixed effects

	OLS	PCSE	2SLS	GMM
ADC(-1)	0.269***	0.266***	0.253***	0.318***
	(0.074)	(0.086)	(0.084)	(0.082)
SF(-1)	0.027	0.031	0.003	0.031
	(0.070)	(0.118)	(0.092)	(0.058)
Balance(-1)	0.338***	0.284***	0.342***	0.409***
	(0.037)	(0.092)	(0.060)	(0.069)
Error	-0.431***	-0.437***	-0.412***	-0.457***
	(0.073)	(0.136)	(0.160)	(0.068)
Growth				
Unemployment				
Elderly	-46.349**	-48.359*	-56.454***	-21.714***
	(21.403)	(25.612)	(16.909)	(7.032)
Government	-174.396***	-182.312***	-185.295***	-67.716**
	(47.238)	(57.375)	(48.384)	(34.420)
Coalition	-25.334	-28.318	-29.348	-12.157
	(37.043)	(42.092)	(30.350)	(10.822)
Concordance	120.418	121.567	163.685*	215.507**
	(134.017)	(117.334)	(96.825)	(106.366)
Departments	-10.428	-11.125	-6.676	-1.267
	(12.975)	(11.763)	(6.212)	(5.532)
Election	0.218	2.565	-0.197	2.173
	(34.765)	(37.988)	(35.255)	(34.923)
Initiative	50.823	52.533	141.035	65.029***
	(81.949)	(85.459)	(91.455)	(18.876)
Referendum	-33.986	-34.863	-49.061	-5.065
	(37.528)	(35.911)	(34.775)	(13.689)
Rule	6.087	10.385	-87.080	-8.294
	(38.326)	(50.066)	(54.374)	(29.349)
Creative * Rule	0.045	0.043	0.071	0.007
	(0.051)	(0.081)	(0.058)	(0.034)
Constant	1669.359***	1755.472***	1544.313**	312.620
	(578.049)	(616.944)	(816.003)	(208.743)
Cantonal FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
R-Squared	41.490	48.510	41.230	-
F-stat / Chi2	9.860	6.450	381.000	901.000
p-value	0.000	0.000	0.000	0.000
N	712	712	703	686

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 55: Results of the simultaneous equations model with cantonal and time fixed effects

	Revenue	Expense
ADC(-1)	0.256***	-0.254***
	(0.068)	(0.071)
SF(-1)	0.066	0.069
	(0.063)	(.072)
Revenue(-1)	0.317***	
	(0.039)	
Expense(-1)		0.482***
		(0.060)
Revenue		0.313***
		(0.077)
Expense	0.662***	
	(0.056)	
Error		-0.535***
		(0.146)
Growth		
Unemployment		
Elderly	-39.569**	53.275***
	(19.893)	(21.240)
Government	-183.044***	126.222***
	(44.172)	(48.953)
Coalition	-30.014	53.707
	(34.159)	(36.647)
Concordance	98.789	-214.642
	(124.249)	(132.784)
Departments	0.701	30.625**
	(13.105)	(13.927)
Election	-5.471	14.389
	(30.803)	(33.189)
Initiative	84.159	-88.301
	(137.616)	(149.792)
Referendum	-10.896	75.335
	(58.462)	(63.078)
Rule	-19.316	62.112
	(48.604)	(52.750)
Creative * Rule	0.029	-0.059
	(0.046)	(0.050)
Constant	1498.028**	-694.256
	(679.364)	(740.579)
Cantonal FE	YES	YES
Time FE	YES	YES
R-Squared	98.850	98.740
F-stat / Chi2	62188.700	54045.190
p-value	0.000	0.000
N	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 56: Results of the single equation model with short time series (1997-2012)

	OLS	REGAR	PCSE	2SLS	GMM
ADC(-1)	0.319***	0.293***	0.353***	0.323***	0.375***
	(0.109)	(0.103)	(0.099)	(0.114)	(0.106)
SF(-1)	0.085	0.101	0.058	0.077	0.098
	(0.106)	(0.098)	(0.118)	(0.138)	(0.064)
Balance(-1)	0.320***	0.201***	0.263***	0.329	0.353***
	(0.076)	(0.053)	(0.098)	(0.073)	(0.077)
Error	-0.493***	-0.482***	-0.491***	-0.348*	-0.478***
	(0.103)	(0.110)	(0.153)	(0.205)	(0.067)
Growth	9.346	4.259	3.220	14.013	12.774
	(19.943)	(17.989)	(20.655)	(17.992)	(18.577)
Unemployment	-39.707*	-28.481	-65.283***	-53.100*	-56.962***
	(22.663)	(44.617)	(24.992)	(28.806)	(13.579)
Elderly	21.820	20.657	-11.524	44.440	-12.323*
	(42.864)	(51.083)	(27.279)	(51.514)	(6.671)
Government	-163.47**	-155.099	-66.600	-184.576**	-63.388*
	(82.727)	(100.010)	(66.314)	(92.730)	(33.088)
Coalition	82.727	23.464	64.596*	20.193	53.940**
	(65.885)	(77.138)	(38.222)	(79.276)	(23.089)
Concordance	40.137	-20.160	44.633	-1.419	42.016
	(133.874)	(267.871)	(149.935)	(395.466)	(94.286)
Departments	-20.032	-20.311	-9.615	-10.912	-13.686
	(20.869)	(42.759)	(14.699)	(33.302)	(8.319)
Election	-12.024	3.085	-1.439	-12.937	-7.666
	(62.049)	(58.342)	(52.864)	(65.326)	(51.887)
Initiative	-93.129	-109.410	60.739*	-147.105	49.580***
	(187.480)	(229.357)	(36.743)	(395.079)	(17.172)
Referendum	-28.418	-25.518	-15.934	-219.553	-15.793
	(68.500)	(120.375)	(30.299)	(173.991)	(16.188)
Rule	61.511	84.350	15.610	7.725	15.311
	(90.597)	(71.616)	(25.080)	(148.017)	(25.556)
Creative * Rule	0.040	0.032	0.067	0.052	0.025
	(0.057)	(0.070)	(0.085)	(0.077)	(0.020)
Constant	1221.052	974.191	301.739	1987.648	361.793
	(907.897)	(1251.13)	(462.052)	(1938.783)	(225.255)
Cantonal FE	YES	YES	NO	YES	YES
R-Squared	21.450	12.730	27.810	7.910	-
F-stat / Chi2	41.370	4.600	121.910	266.510	684.420
p-value	0.000	0.000	0.000	0.000	0.000
N	415	389	415	415	413

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Table 57: Results of the simultaneous equations model with short time series (1997-2012)

	Revenue	Expense
ADC(-1)	0.289***	-0.236***
	(0.089)	(0.096)
SF(-1)	0.095	0.085
	(0.081)	(0.095)
Revenue(-1)	0.296***	
	(0.049)	
Expense(-1)		0.439***
		(0.084)
Revenue		0.251**
		(0.111)
Expense	0.724***	
	(0.085)	
Error		-0.610***
		(0.205)
Growth	21.254	-36.259**
	(14.924)	(17.587)
Unemployment	-37.343	67.397**
	(27.753)	(30.654)
Elderly	47.888	151.774***
	(47.145)	(52.896)
Government	-201.901***	116.830
	(78.476)	(87.790)
Coalition	-34.843	-12.076
	(58.764)	(64.402)
Concordance	117.452	20.843
	(197.505)	(213.841)
Departments	-4.954	0.217
	(30.964)	(33.571)
Election	-18.703	12.557
	(50.432)	(54.158)
Initiative	35.386	174.868
	(330.869)	(340.548)
Referendum	3.687	181.556
	(196.876)	(224.048)
Rule	-37.138	105.297
	(100.691)	(108.267)
Creative * Rule	0.031	-0.088
	(0.061)	(0.066)
Constant	252.908	-1812.212
	(1746.992)	(1812.912)
Cantonal FE	YES	YES
R-Squared	98.430	98.240
F-stat / Chi2	26767.860	22618.290
p-value	0.000	0.000
N	415	415

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R-Squared is the coefficient of determination. and Joint is the test of joint significance (F-test or Chi2). Results were computed with Stata 11 SE.

Q - Quantitative impact of finance ministers' personal characteristics in the use of creative accounting

Potential endogenous covariates

The Hausman Test is used to determine whether or not one of the independent variables in a regression suffers from endogeneity (omitted variable biased, measurement error, or reverse causality). In our case, the Hausmann test is used in order to detect the presence of a reverse causal effect between the variables "Balance" and "ADC". To do so, the test is implemented through three steps that are as follows:

The first step (Step 1) consist in running the structural equation, which is expressed as:

$$ADC_{ijt} = \alpha + \beta Balance_{jt} + \delta Ideology_{ijt} + \vartheta Experience_{ijt} + \gamma Education_{ijt} + \mu W_{ijt} + \varphi Z_{jt} + \theta_j + \tau_t + \epsilon_{ijt}$$

where the variable "Balance" is the suspected endogenous covariate.

Then, the second step (Step 2) aims at finding an appropriate instrumental variable for the potential endogenous regressor. Since our data do not reveal the presence of second order autocorrelation (as shown in Table 62 below), the second lag value of the variable "Balance" is used as an instrument. Table 58below reports the covariance between the potentially endogenous covariate and its instrument.

Table 58: Covariance between the potentially endogenous covariates and the instruments

Variables	Balance
Instrument	Balance(-2)
Covariance	0.4310

(-2) denotes the second lag value of the variable whereas (D1) refers to the first difference of the variable

Then, by running a reduced form regression we determine whether "Balance(-2) is a strong instrument. The reduced form regression consists in considering the potentially endogenous covariate ("Balance") as the dependent variable and to regress it on all exogenous variables of the structural equation and on its instrument ("Balance(-2)"). The reduced form model is therefore as follows:

$$Balance_{ijt} = \alpha + \zeta Balance(-2)_{jt} + \delta Ideology_{ijt} + \vartheta Experience_{ijt} + \gamma Education_{ijt} + \mu W_{ijt} + \varphi Z_{jt} + \theta_j + \tau_t + \nu_{ijt}$$

The Wald test then provides evidence that the instrumental variable ("Balance(-2)") is statisitcally significant in determining the variable "Balance". "Balance(-2) must therefore be considered as a good instrument.

Table 59: Wald test for the statistical significance

Variable	Balance(-2)
F-test	23.31
p-value	0.0000

H0: Variable not statistically significantly different from 0.

The third and final step (Step 3) consists in interpretating the Hausmann test and thus allows to determine whether "Balance" must be consider as endogenous. To do so, we have take the residuals of the reduced form equation ("ν") and those residuals back into the structural equation. Finally, it is the statistical significance of these residuals that reveal whether the variable "Balance" is endogeneous according to the following hypothesis:

- H0: $\nu = 0 \implies$ "Balance" is exogenous

- H1: $\nu \neq 0 \implies$ "Balance" is endogenous

The structural equation is now expressed as:

$$ADC_{ijt} = \alpha + \rho \nu_{ijt} + \beta Balance_{jt} + \delta Ideology_{ijt} + \vartheta Experience_{ijt} + \gamma Education_{ijt} + \mu W_{ijt} + \varphi Z_{jt} + \theta_j + \tau_t + \epsilon_{ijt}$$

and the results show that ν is not statistically signicant as demonstrated in the Table below. H0 is therefore accepted, i.e. the variable "Balance" is effectively exogenous.

Table 60: OLS regression for the structural equation

	OLS
Residuals	-0.0345
	(0.093)
Error	0.007
	(0.056)
Rule	12.204
	(25.023)
Election	-4.084
	(14.951)
Coalition	31.115
	(19.164)
Concordance	-0.521
	(0.771)
Age	3.607
	(2.690)
Gender	20.129
	(41.687)
Balance	0.121
	(0.099)
Ideology	10.989
	(12.058)
Experience	-0.231
	(0.282)
Apprenticeship	-9.220
	(32.796)
Economics	142.777***
	(51.000)
Law	22.846
	(31.122)
Politics	15.047
	(82.979)
Constant	-274.590
	(209.158)
Cantonal FE	YES
Time FE	YES
R-Squared	23.59
F-test	3.10
p-value	0.0000
N	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Heteroskedasticity

Table 61: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

Chi2	1466.94
P-value	0.0000

H0: No heteroskedasticity

Autocorrelation

Table 62: Wooldridge test for autocorrelation of order one & Arellano-Bond test for autocorrelation of order one and two

	AR(1)		AR(2)	
	F-stat	p-value	z-stat	p-value
Wooldridge	2.609	0.1188		
Arellano-Bond	-1.780	0.0751	0.950	0.3397

H0: No autocorrelation

Fixed effects

Table 63: Hausman test for random versus fixed effects

Chi2	25.78
p-value	0.0182

H0: Difference in coefficients not systematic

Table 64: Wald test for time fixed effects

Chi2	8.00
p-value	0.0000

H0: Time fixed effects are not jointly significant

Multicolinearity

Table 65: Variance inflation factor (VIF) for the regressors

Variables	cantonal and time FE		FE and Trends		without FE	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Trend	-	-	9.47	0.105567	-	-
Coalition	5.53	0.180875	5.53	0.180875	1.13	0.887733
Rule	4.64	0.215715	4.64	0.215715	1.1	0.906303
Law	4.25	0.235551	4.25	0.235551	2.93	0.341051
Apprenticeship	3.84	0.260336	3.84	0.260336	2.79	0.358424
Economics	3.33	0.300528	3.33	0.300528	2.34	0.427451
Age	2.79	0.358086	2.79	0.358086	1.44	0.694866
Ideology	2.18	0.458366	2.18	0.458366	1.15	0.86782
Experience	1.92	0.520191	1.92	0.520191	1.5	0.666824
Balance	1.76	0.567698	1.76	0.567698	1.22	0.822603
Politics	1.71	0.586265	1.71	0.586265	1.23	0.810314
Gender	1.64	0.610082	1.64	0.610082	1.14	0.87929
Concordance	1.64	0.610494	1.64	0.610494	1.08	0.92915
Error	1.59	0.629298	1.59	0.629298	1.25	0.799497
Election	1.05	0.951912	1.05	0.951912	1.01	0.986042
Mean VIF	3.23		2.6		1.52	

Multicolinearity may be an issue when the VIF is equal or higher than 10.

Robustness checks

Table 66: Results of the linear regressions model - OLS estimation

	(1)	(2)	(3)	(4)	(5)
Error	0.000	-0.056	-0.057	-0.050	-0.009
	(0.033)	(0.040)	(0.039)	(0.042)	(0.033)
Rule	-1.480	3.729	5.860	20.052	15.540
	(24.430)	(24.400)	(24.180)	(22.909)	(23.137)
Election	-3.650	-4.032	-2.417	-6.404	-4.580
	(14.786)	(14.528)	(15.107)	(14.58)	(15.170)
Coalition	28.468	30.395	30.009	28.876	30.860
	(18.668)	(20.622)	(20.022)	(19.204)	(18.906)
Concordance	-0.680	-0.627	-0.630	-0.241	-0.355
	(0.962)	(1.025)	(0.991)	(0.827)	(0.759)
Age	1.655	1.828	3.126	2.456	3.427
	(2.089)	(2.401)	(3.088)	(2.029)	(2.513)
Gender	14.374	-10.880	-12.140	-7.910	11.426
	(52.319)	(57.696)	(57.466)	(49.593)	(46.826)
Balance	0.104***				0.091***
	(0.0367)				(0.031)
Ideology		-0.848			9.757
		(8.869)			(10.385)
Experience			-0.267		-0.220
			(0.289)		(0.250)
Apprenticeship				-11.117	-4.722
				(31.861)	(32.044)
Economics				162.329***	151.036***
				(50.753)	(47.782)
Law				19.708	29.527
				(30.692)	(31.116)
Politics				-11.825	19.782
				(66.864)	(71.728)
Constant	-102.989	-115.890	-159.691	-193.781	-278.911
	(175.097)	(231.600)	(220.166)	(179.474)	(199.580)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	19.06	15.36	15.55	20.27	23.08
F-stat /Chi2	1.84	1.85	2.24	2.00	2.31
p-value	0.0071	0.0060	0.0000	0.0000	0.0000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 67: Results of the linear regressions model - PCSE estimation

	(1)	(2)	(3)	(4)	(5)
Error	-0.011	-0.048	-0.050	-0.047	-0.020
	(0.043)	(0.042)	(0 .041)	(0.042)	(0.043)
Rule	-1.436	3.559	6.691	18.052	15.364
	(37.797)	(39.528)	(38.336)	(37.847)	(35.110)
Election	-7.816	-8.277	-6.172	-10.673	-8.631
	(15.288)	(14.787)	(15.078)	(14.101)	(14.865)
Coalition	26.891	27.246	27.632	24.126	26.536
	(23.182)	(23.131)	(23.625)	(24.578)	(23.641)
Concordance	-0.562	-0.531	-0.543	-0.178	-0.246
	(0 .893)	(0.938)	(0.925)	(0.938)	(0.886)
Age	1.683	1.793	3.796	2.326	3.774
	(2.166)	(2.265)	(2.733)	(2.287)	(2.781)
Gender	3.810	-12.012	-14.294	-10.653	0.267
	(62.594)	(67.388)	(67.202)	(66.661)	(62.457)
Balance	0.080***				0.067***
	(0.024)				(0.022)
Ideology		-2.565			6.951
		(10.341)			(10.299)
Experience			-0.371		-0.277
			(0.298)		(0.320)
Apprenticeship				-12.556	-4.943
				(42.452)	(41.098)
Economics				148.192***	144.224***
				(51.447)	(48.902)
Law				0.496	14.285
				(44.962)	(44.743)
Politics				-20.791	-4.331
				(135.664)	(135.294)
Constant	-246.433	-248.784	-348.571	-301.737	-410.235
	(232.632)	(237.295)	(256.893)	(250.092)	(257.193)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	30.71	27.78	28.00	29.65	28.03
F-stat	5.08	9.80	1.98	4.74	1.48
p-value	0.0000	0.0000	0.0000	0.0000	0.0000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 68: Results of the linear regressions model - REGAR estimation

	(1)	(2)	(3)	(4)	(5)
Error	-0.013	-0.054	-0.055	-0.054	-0.023
	(0.042)	(0.042)	(0.041)	(0.040)	(0.042)
Rule	-0.065	5.166	7.478	22.338	17.898
	(22.821)	(24.059)	(24.135)	(23.126)	(22.320)
Election	-7.083	-7.077	-5.251	-7.783	-6.715
	(17.458)	(17.344)	(17.365)	(17.259)	(17.447)
Coalition	23.746	22.588	22.468	21.054	25.012
	(22.512)	(23.731)	(23.634)	(22.809)	(22.127)
Concordance	-0.515	-0.425	-0.453	-0.077	-0.216
	(0.802)	(0.846)	(0.846)	(0.801)	(0.770)
Age	1.543	1.644	3.480	2.341	3.376
	(1.847)	(1.935)	(2.382)	(1.850)	(2.237)
Gender	2.773	-14.669	-16.647	-10.734	2.511
	(35.662)	(37.111)	(37.076)	(35.258)	(34.330)
Balance	0.082***				0.073***
	(0.020)				(0.020)
Ideology		-1.424			9.032
		(10.180)			(9.742)
Experience			-0.349		-0.215
			(0.268)		(0.260)
Apprenticeship				-11.578	-6.048
				(39.379)	(38.293)
Economics				165.478***	156.755***
				(42.890)	(41.804)
Law				10.027	21.277
				(38.183)	(37.351)
Politics				-21.232	3.368
				(75.077)	(75.946)
Constant	-84.214	-29.702	-99.893	-175.230	-275.811
	(120.723)	(131.208)	(124.033)	(125.749)	(147.903)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	17.10	14.89	15.11	19.01	21.03
F-stat	3.37	2.86	2.91	3.55	3.74
p-value	0.0000	0.0000	0.0000	0.0000	0.0000
N	703	703	703	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 69: Results of the logistic regressions model - Tobit estimation

	(1)	(2)	(3)	(4)	(5)
Error	0.103	-0.171	-0.175	-0.137	0.080
	(0.124)	(0.105)	(0.103)	(0.119)	(0.114)
Rule	25.504	52.953	50.827	46.585	21.818
	(59.848)	(69.897)	(67.899)	(50.652)	(48.078)
Election	-12.872	-9.596	-4.160	-9.587	-8.168
	(30.822)	(29.620)	(30.859)	(29.460)	(31.107)
Coalition	0.045	26.502	17.422	1.469	-20.480
	(41.561)	(43.333)	(39.270)	(41.213)	(47.519)
Concordance	-0.626	-0.833	-0.637	0.641	0.541
	(3.254)	(2.398)	(2.242)	(2.201)	(2.750)
Age	3.227	3.303	6.722	4.300	7.180
	(6.099)	(7.488)	(8.367)	(5.917)	(7.067)
Gender	28.419	-65.208	-72.787	-16.302	43.866
	(131.782)	(159.153)	(154.089)	(126.818)	(117.662)
Balance	0.306***				0.266***
	(0.104)				(0.076)
Ideology		-6.870			19.849
		(42.165)			(44.002)
Experience			-0.800		-0.755
			(0.561)		(0.651)
Apprenticeship				22.591	43.376
				(95.770)	(96.822)
Economics				342.852**	264.580*
				(161.332)	(141.879)
Law				14.686	21.005
				(80.356)	(87.433)
Politics				-22.828	87.302
				(111.643)	(140.349)
Constant	-340.078	-366.670	-509.312	-569.633	-701.642
	(397.957)	(668.150)	(527.616)	(423.229)	(571.051)
Cantonal FE	NO	NO	NO	NO	NO
Time FE	NO	NO	NO	NO	NO
Log Likelihood (4th iteration)	-2534.827	-2560.855	-2559.275	-2538.446	-2519.340
Wald chi2	1.610	0.570	0.780	1.200	3.080
Prob > chi2	0.172	0.792	0.624	0.335	0.007
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 70: Results of the logistic regressions model - Logit estimation

	(1)	(2)	(3)	(4)	(5)
Error	0.000**	0.000	0.000	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rule	0.128	0.238	0.235	0.255	0.141
	(0.262)	(0.280)	(0.270)	(0.251)	(0.251)
Election	0.036	0.025	0.050	0.009	0.045
	(0.098)	(0.099)	(0.104)	(0.107)	(0.111)
Coalition	-0.206	-0.124	-0.160	-0.158	-0.269
	(0.173)	(0.171)	(0.173)	(0.184)	(0.188)
Concordance	0.000	0.000	0.000	0.002	0.001
	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)
Age	0.008	0.009	0.027	0.011	0.026
	(0.027)	(0.029)	(0.036)	(0.027)	(0.032)
Gender	-0.049	-0.255	-0.328	-0.206	-0.003
	(0.400)	(0.366)	(0.344)	(0.309)	(0.368)
Balance	0.001***				0.001***
	(0.000)				(0.000)
Ideology		-0.121			-0.037
		(0.106)			(0.124)
Experience			-0.003		-0.004
			(0.002)		(0.003)
Apprenticeship				0.233	0.314
				(0.323)	(0.349)
Economics				1.012***	0.631
				(0.386)	(0.415)
Law				0.109	0.101
				(0.368)	(0.395)
Politics				0.729	0.913
				(0.580)	(0.738)
Constant	-0.293	0.294	1.096	-1.025	-0.991
	(1.731)	(2.179)	(2.193)	(1.856)	(2.175)
Cantonal FE	NO	NO	NO	NO	NO
Time FE	NO	NO	NO	NO	NO
Log Likelihood (4th iteration)	0.000	0.000	0.000	0.000	0.000
Wald chi2	16.730	5.700	7.100	13.120	44.740
Prob > chi2	0.033	0.681	0.526	0.286	0.000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 71: Results of the logistic regressions model - Probit estimation

	(1)	(2)	(3)	(4)	(5)
Error	0.000**	0.000	0.000	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rule	0.095	0.146	0.143	0.157	0.103
	(0.164)	(0.174)	(0.168)	(0.156)	(0.157)
Election	0.017	0.015	0.030	0.004	0.023
	(0.061)	(0.062)	(0.064)	(0.066)	(0.069)
Coalition	-0.137	-0.077	-0.097	-0.102	-0.174
	(0.106)	(0.105)	(0.107)	(0.114)	(0.117)
Concordance	0.000	0.000	0.000	0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Age	0.005	0.005	0.017	0.006	0.016
	(0.017)	(0.018)	(0.022)	(0.016)	(0.019)
Gender	-0.028	-0.153	-0.200	-0.124	-0.007
	(0.240)	(0.224)	(0.210)	(0.190)	(0.223)
Balance	0.000***				0.000***
	(0.000)				(0.000)
Ideology		-0.074			-0.022
		(0.065)			(0.077)
Experience			-0.002		-0.002
			(0.001)		(0.001)
Apprenticeship				0.143	0.184
				(0.195)	(0.209)
Economics				0.627***	0.408
				(0.235)	(0.251)
Law				0.064	0.067
				(0.223)	(0.238)
Politics				0.447	0.554
				(0.360)	(0.453)
Constant	-0.173	0.179	-0.654	-0.598	-0.600
	(1.078)	(1.355)	(1.352)	(1.132)	(1.329)
Cantonal FE	NO	NO	NO	NO	NO
Time FE	NO	NO	NO	NO	NO
Log Likelihood (4th iteration)	0.000	0.000	0.000	0.000	0.000
Wald chi2	17.020	5.770	7.350	13.52	44.150
Prob > chi2	0.030	0.673	0.499	0.261	0.000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 72: Results of the linear regressions model - OLS estimation without the canton of Uri

	(1)	(2)	(3)	(4)	(5)
Error	-0.003	-0.038	-0.039	-0.038	-0.008
	(0.030)	(0.036)	(0.037)	(0.039)	(0.031)
Rule	-12.093	-9.861	-7.617	-0.129	-1.260
	(22.040)	(21.718)	(21.735)	(19.601)	(20.570)
Election	-0.900	-1.070	1.171	-2.981	-0.507
	(14.336)	(14.050)	(14.151)	(13.757)	(14.204)
Coalition	23.079	23.599	24.184	26.501	28.105*
	(15.446)	(16.601)	(16.510)	(16.582)	(16.630)
Concordance	-1.040	-1.037	-1.044	-0.758	-0.820
	(0.909)	(0.953)	(0.898)	(0.789)	(0.727)
Age	0.857	0.816	2.705	1.410	3.111
	(1.730)	(1.864)	(2.455)	(1.655)	(2.158)
Gender	60.136*	46.979	43.637	42.208	52.607
	(35.373)	(33.264)	(33.010)	(32.540)	(33.612)
Balance	0.070***				0.067***
	(0.025)				(0.024)
Ideology		-2.200			5.527
		(7.810)			(9.007)
Experience			-0.379*		-0.342*
			(0.207)		(0.195)
Apprenticeship				-24.987	-16.116
				(29.726)	(30.367)
Economics				92.974**	87.068**
				(39.478)	(39.099)
Law				22.715	32.579
				(21.941)	(23.918)
Politics				-0.999	10.330
				(54.236)	(61.683)
Constant	-22.078	-9.075	-82.678	-90.366	-180.979
	(127.679)	(161.267)	(159.069)	(139.192)	(165.267)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.179	0.156	0.161	0.182	0.205
F-stat	2.210	2.130	2.130	2.020	2.190
p-value	0.000	0.000	0.000	0.002	0.001
N	700	700	700	700	700

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 73: Results of the linear regressions model - PCSE estimation without the canton of Uri

	(1)	(2)	(3)	(4)	(5)
Error	-0.021	-0.045	-0.044	-0.045	-0.027
	(0.039)	(0.037)	(0.038)	(0.039)	(0.038)
Rule	-10.425	-7.302	-5.501	0.358	-0.853
	(32.157)	(33.025)	(33.027)	(30.166)	(29.406)
Election	-3.668	-3.762	-2.080	-5.363	-3.689
	(12.986)	(12.598)	(12.812)	(12.132)	(12.738)
Coalition	22.603	23.186	23.755	23.805	26.208
	(20.724)	(21.059)	(21.463)	(22.140)	(21.236)
Concordance	-0.865	-0.853	-0.859	-0.613	-0.659
	(0.934)	(0.964)	(0.960)	(0.970)	(0.929)
Age	0.760	0.774	2.504	1.220	2.772
	(1.988)	(2.074)	(2.437)	(2.071)	(2.273)
Gender	59.882	53.936	51.115	50.546	53.068
	(52.544)	(54.378)	(55.179)	(55.421)	(53.075)
Balance	0.049**				0.046**
	(0.021)				(0.020)
Ideology		0.362			6.118
		(9.419)			(8.424)
Experience			-0.318		-0.271
			(0.296)		(0.293)
Apprenticeship				-24.940	-18.296
				(38.097)	(37.738)
Economics				75.726*	76.335*
				(45.042)	(43.257)
Law				10.044	20.342
				(36.442)	(36.787)
Politics				-8.710	0.934
				(136.364)	(130.109)
Constant	-147.248	-159.553	-230.006	-199.043	-311.387
	(197.466)	(207.880)	(204.060)	(219.176)	(216.938)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.235	0.216	0.218	0.223	0.243
Chi2	4.680	1.760	2.660	2.320	1.040
p-value	0.000	0.000	0.000	0.000	0.000
N	700	700	700	700	700

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 74: Results of the linear regressions model - REGAR estimation without the canton of Uri

	(1)	(2)	(3)	(4)	(5)
Error	-0.022	-0.049	-0.047	-0.048	-0.027
	(0.036)	(0.036)	(0.035)	(0.035)	(0.036)
Rule	-10.772	-7.940	-6.783	0.791	-1.123
	(19.956)	(20.594)	(20.471)	(20.424)	(19.863)
Election	-3.715	-3.495	-1.836	-4.806	-3.556
	(14.951)	(14.882)	(14.937)	(14.925)	(15.086)
Coalition	18.453	17.989	18.408	20.046	23.207
	(19.813)	(20.448)	(20.261)	(20.101)	(19.680)
Concordance	-0.832	-0.797	-0.829	-0.564	-0.659
	(0.705)	(0.727)	(0.723)	(0.709)	(0.688)
Age	0.630	0.620	2.342	1.240	2.714
	(1.630)	(1.675)	(2.077)	(1.645)	(2.026)
Gender	58.670*	51.362	48.476	47.045	51.708
	(32.007)	(32.790)	(32.623)	(31.980)	(31.367)
Balance	0.052***				0.051***
	(0.017)				(0.017)
Ideology		0.329			6.453
		(8.725)			(8.650)
Experience			-0.324		-0.277
			(0.234)		(0.236)
Apprenticeship				-26.541	-20.042
				(34.764)	(34.070)
Economics				89.623**	86.120**
				(89.949)	(86.120)
Law				17.388	26.671
				(33.894)	(33.368)
Politics				-8.042	3.139
				(65.133)	(66.455)
Constant	26.892	-5.844	-63.565	-35.633	-140.182
	(105.631)	(112.795)	(108.688)	(110.789)	(128.794)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.156	0.143	0.142	0.162	0.178
F-stat	2.890	2.610	2.670	2.810	2.910
p-value	0.000	0.000	0.000	0.000	0.000
N	675	675	675	675	675

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 75: Results of the linear regressions model - OLS estimation without fixed effects

	(1)	(2)	(3)	(4)	(5)
Error	0.026	-0.066*	-0.057	-0.035	0.011
	(0.046)	(0.038)	(0.043)	(0.051)	(0.039)
Rule	-9.139	4.478	3.676	3.857	-6.308
	(17.213)	(19.077)	(18.536)	(14.048)	(14.016)
Election	-7.199	-8.129	-6.555	-9.696	-8.296
	(15.243)	(14.112)	(14.899)	(14.270)	(15.858)
Coalition	0.640	17.304	15.058	4.053	-4.910
	(11.547)	(13.941)	(12.664)	(11.722)	(12.156)
Concordance	-0.296	-0.458	-0.402	0.302	0.311
	(0.878)	(0.859)	(0.822)	(0.934)	(0.900)
Age	1.132	1.637	2.642	1.738	1.890
	(1.915)	(2.349)	(2.603)	(1.953)	(2.239)
Gender	13.763	-26.240	-26.430	-13.424	5.741
	(55.519)	(68.895)	(68.151)	(58.952)	(52.358)
Balance	0.113***				0.093***
	(0.048)				(0.034)
Ideology		7.246			18.078
		(8.925)			(11.495)
Experience			-0.251		-0.105
			(0.254)		(0.281)
Apprenticeship				-8.465	-5.076
				(29.467)	(29.421)
Economics				154.512**	141.23**
				(77.419)	(76.225)
Law				2.051	5.647
				(21.900)	(26.897)
Politics				-36.596	22.135
				(33.022)	(44.931)
Constant	60.142	-50.466	-36.495	-53.663	-136.695
	(114.016)	(186.770)	(149.526)	(133.905)	(166.160)
Cantonal FE	NO	NO	NO	NO	NO
Time FE	NO	NO	NO	NO	NO
R-Squared	0.100	0.000	0.001	0.062	0.151
Chi2	8.980	5.190	4.770	11.650	25.390
p-value	0.344	0.737	0.782	0.390	0.031
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 76: Results of the linear regressions model - PCSE estimation without fixed effects

	(1)	(2)	(3)	(4)	(5)
Error	-0.007	-0.058	-0.049	-0.043	-0.024
	(0.053)	(0.051)	(0.053)	(0.054)	(0.052)
Rule	-18.158	-13.665	-16.504	-9.092	-12.822
	(13.988)	(15.553)	(16.004)	(15.696)	(14.856)
Election	-13.153	-13.374	-11.142	-14.812	-13.915
	(15.378)	(14.296)	(14.504)	(13.963)	(14.828)
Coalition	-14.735	-12.445	-13.272	-16.321	-20.563
	(19.382)	(22.088)	(21.244)	(20.912)	(18.737)
Concordance	0.718	0.757	0.870	1.319	1.219
	(0.889)	(1.069)	(1.053)	(1.083)	(0.946)
Age	1.681	2.089	3.831	1.952	2.059
	(2.142)	(2.448)	(3.345)	(2.395)	(2.959)
Gender	6.157	-16.463	-13.590	-9.525	-9.812
	(83.147)	(90.069)	(89.581)	(88.311)	(82.432)
Balance	0.075**				0.061**
	(0.031)				(0.029)
Ideology		13.116			21.217*
		(11.349)			(11.328)
Experience			-0.361		-0.083
			(0.411)		(0.400)
Apprenticeship				-8.233	-4.282
				(51.484)	(47.313)
Economics				138.524**	144.816**
				(68.737)	(62.140)
Law				-34.243	-19.981
				(50.769)	(47.832)
Politics				-25.752	18.882
				(177.481)	(175.489)
Constant	8.438	-97.568	-87.470	-56.609	-171.612
	(151.795)	(162.990)	(201.093)	(191.750)	(182.953)
Cantonal FE	NO	NO	NO	NO	NO
Time FE	NO	NO	NO	NO	NO
R-Squared	0.025	0.007	0.007	0.031	0.055
Chi2	11.600	6.150	5.580	15.650	29.670
p-value	0.170	0.630	0.695	0.155	0.009
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 77: Results of the linear regressions model - REGAR estimation without fixed effects

	(1)	(2)	(3)	(4)	(5)
Error	0.003	-0.062	-0.053	-0.038	-0.003
	(0.039)	(0.039)	(0.038)	(0.038)	(0.040)
Rule	-7.663	0.513	-0.568	0.961	-7.202
	(15.513)	(16.757)	(16.883)	(15.877)	(14.699)
Election	-11.499	-11.938	-10.131	-12.937	-11.631
	(17.753)	(17.622)	(17.666)	(17.601)	(17.812)
Coalition	1.970	10.091	8.323	-0.697	-8.015
	(15.771)	(17.122)	(17.298)	(16.414)	(15.008)
Concordance	-0.170	-0.223	-0.157	0.461	0.485
	(0.725)	(0.758)	(0.761)	(0.734)	(0.709)
Age	1.440	1.814	3.120	1.816	2.066
	(1.706)	(1.783)	(2.137)	(1.711)	(1.974)
Gender	3.270	-22.664	-23.067	-11.944	0.418
	(33.859)	(35.107)	(35.078)	(33.549)	(32.935)
Balance	0.089***				0.079***
	(0.018)				(0.019)
Ideology		8.601			18.758**
		(9.383)			(8.832)
Experience			-0.299		-0.106
			(0.254)		(0.247)
Apprenticeship				-7.909	-4.544
				(37.686)	(36.622)
Economics				148.520***	141.539***
				(39.686)	(39.101)
Law				-7.986	-1.686
				(36.325)	(35.360)
Politics				-35.427	16.889
				(73.949)	(74.135)
Constant	30.698	-59.517	-51.971	-48.014	-148.795
	(122.409)	(143.532)	(135.773)	(129.594)	(141.213)
Cantonal FE	NO	NO	NO	NO	NO
Time FE	NO	NO	NO	NO	NO
R-Squared	0.093	0.000	0.000	0.070	0.150
Chi2	25.650	4.900	5.540	36.490	60.960
p-value	0.002	0.843	0.785	0.000	0.000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 78: Results of the linear regressions model - OLS estimation with a trend

	(1)	(2)	(3)	(4)	(5)
Error	0.000	-0.056	-0.057	-0.050	-0.009
	(0.033)	(0.040)	(0.039)	(0.042)	(0.033)
Rule	-1.480	3.729	5.860	20.052	15.540
	(24.430)	(24.400)	(24.180)	(22.909)	(23.137)
Election	-3.650	-4.032	-2.417	-6.404	-4.580
	(14.786)	(14.528)	(15.107)	(14.580)	(15.170)
Coalition	28.468	30.395	30.009	28.876	30.860
	(18.668)	(20.622)	(20.022)	(19.2049)	(18.906)
Concordance	-0.680	-0.627	-0.630	-0.241	-0.355
	(0.962)	(1.025)	(0.991)	(0.827)	(0.759)
Age	1.655	1.828	3.126	2.456	3.427
	(2.089)	(2.401)	(3.088)	(2.029)	(2.513)
Gender	14.374	-10.880	-12.140	-7.910	11.426
	(52.319)	(57.696)	(57.466)	(49.593)	(46.826)
Balance	0.104***				0.091***
	(0.036)				(0.031)
Ideology		-0.848			9.757
		(8.869)			(10.385)
Experience			-0.267		-0.220
			(0.289)		(0.250)
Apprenticeship				-11.117	-4.722
				(31.861)	(32.044)
Economics				162.329***	151.036***
				(50.753)	(47.782)
Law				19.708	29.527
				(30.692)	(31.116)
Politics				-11.825	19.782
				(66.864)	(71.728)
Trend	-0.103	-0.033	-0.363	-1.770	-2.114
	(1.653)	(1.951)	(1.908)	(1.967)	(1.795)
Constant	-102.885	-115.857	-159.327	-192.011	-276.797
	(175.697)	(232.062)	(220.678)	(180.066)	(199.606)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.196	0.077	0.074	0.121	0.189
F-stat	1.840	1.850	2.240	2.000	2.310
p-value	0.007	0.007	0.001	0.002	0.000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 79: Results of the linear regressions model - PCSE estimation with a trend

	(1)	(2)	(3)	(4)	(5)
Error	-0.011	-0.048	-0.050	-0.047	-0.020
	(0.043)	(0.042)	(0.041)	(0.042)	(0.043)
Rule	-1.436	3.559	6.691	18.052	15.364
	(37.797)	(39.528)	(38.336)	(37.847)	(35.110)
Election	-7.816	-8.277	-6.172	-10.673	-8.631
	(15.288)	(14.787)	(15.078)	(14.101)	(14.865)
Coalition	26.891	27.246	27.632	24.126	26.536
	(23.182)	(23.131)	(23.625)	(24.578)	(23.641)
Concordance	-0.562	-0.531	-0.543	-0.178	-0.246
	(0.893)	(0.938)	(0.925)	(0.938)	(0.886)
Age	1.683	1.793	3.796	2.326	3.774
	(2.166)	(2.265)	(2.733)	(2.287)	(2.781)
Gender	3.810	-12.012	-14.294	-10.653	0.267
	(62.594)	(67.388)	(67.202)	(66.661)	(62.457)
Balance	0.080***				0.067***
	(0.024)				(0.022)
Ideology		-2.565			6.951
		(10.341)			(10.299)
Experience			-0.371		-0.277
			(0.298)		(0.320)
Apprenticeship				-12.556	-4.943
				(42.452)	(41.098)
Economics				148.192***	144.224***
				(51.447)	(48.902)
Law				0.496	14.285
				(44.962)	(44.743)
Politics				-20.791	-4.331
				(135.664)	(135.294)
Trend	0.120	0.160	-0.332	-1.328	-1.737
	(2.629)	(2.662)	(2.599)	(2.879)	(2.822)
Constant	-246.554	-248.945	-348.239	-300.408	-408.497
	(234.069	(238.595)	(258.179)	(251.348)	(258.201)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.307	0.278	0.280	0.297	0.322
Chi2	5.080	9.800	1.980	4.740	1.370
p-value	0.000	0.000	0.000	0.000	0.000
N	729	729	729	729	729

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 80: Results of the linear regressions model - REGAR estimation with a trend

	(1)	(2)	(3)	(4)	(5)
Error	-0.013	-0.054	-0.055	-0.054	-0.023
	(0.042)	(0.042)	(0.041)	(0.040)	(0.042)
Rule	-0.065	5.166	7.478	22.338	17.898
	(22.821)	(24.059)	(24.135)	(23.126)	(22.320)
Election	-7.083	-7.077	-5.251	-7.783	-6.715
	(17.458)	(17.344)	(17.365)	(17.259)	(17.447)
Coalition	23.746	22.588	22.468	21.054	25.012
	(22.512)	(23.731)	(23.634)	(22.809)	(22.127)
Concordance	-0.515	-0.425	-0.453	-0.077	-0.216
	(0.802)	(0.846)	(0.846)	(0.801)	(0.770)
Age	1.543	1.644	3.480	2.341	3.376
	(1.847)	(1.935)	(2.382)	(1.850)	(2.237)
Gender	2.773	-14.669	-16.647	-10.734	2.511
	(35.662)	(37.111)	(37.076)	(35.258)	(34.330)
Balance	0.082***				0.073***
	(0.020)				(0.020)
Ideology		-1.424			9.032
		(10.180)			(9.742)
Experience			-0.349		-0.215
			(0.268)		(0.260)
Apprenticeship				-11.578	-6.048
				(39.379)	(38.293)
Economics				165.478***	156.755***
				(42.890)	(41.804)
Law				10.027	21.277
				(38.183)	(37.351)
Politics				-21.232	3.368
				(75.077)	(75.946)
Trend	-11.436	-16.958	-14.937	-9.817	-3.215
	(54.241)	(53.954)	(53.824)	(53.624)	(54.066)
Constant	285.121	469.699	323.533	96.456	-220.887
	(1452.449)	(1371.605)	(1362.951)	(1427.879)	(1508.97)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.171	0.083	0.079	0.135	0.192
F-stat	3.370	2.860	2.910	3.550	3.740
p-value	0.000	0.000	0.000	0.000	0.000
N	703	703	703	703	703

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 81: Results of the linear regressions model - OLS estimation with short time period

	(1)	(2)	(3)	(4)	(5)
Error	0.020	-0.015	-0.013	-0.014	0.003
	(0.037)	0.041	(0.042)	(0.042)	(0.036)
Rule	-1.416	2.116	4.877	10.165	11.713
	(26.312)	(25.827)	(24.695)	(24.525)	(26.844)
Election	4.713	3.293	5.704	4.268	6.016
	(23.098)	(22.492)	(22.856)	(23.135)	(23.506)
Coalition	21.853	17.839	14.520	24.132	31.121
	(26.038)	(26.677)	(26.747)	(26.174)	(26.340)
Concordance	-1.267	-1.147	-1.266	-0.865	-1.125
	(1.328)	(1.329)	(1.285)	(1.097)	(1.089)
Age	-0.051	0.130	2.506	0.117	1.071
	(2.760)	(2.955)	(4.168)	(2.526)	(3.482)
Gender	58.542	44.402	41.533	32.608	37.635
	(48.730)	(42.851)	(47.494)	(47.442)	(44.690)
Balance	0.067**				0.064**
	(0.027)				(0.027)
Ideology		2.178			12.650
		(15.488)			(14.866)
Experience			-0.528		-0.257
			(0.446)		(0.384)
Apprenticeship				-36.246	-36.074
				(39.349)	(43.430)
Economics				155.014***	147.225***
				(57.239)	(53.920)
Law				22.929	35.964
				(32.620)	(34.160)
Politics				15.451	39.206
				(89.698)	(81.681)
Constant	96.497	69.959	22.597	26.768	-82.100
	(189.859)	(226.154)	(235.158)	(188.662)	(231.907)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.176	0.137	0.140	0.145	0.166
F-stat	1.900	1.850	1.900	2.120	2.310
p-value	0.021	0.026	0.021	0.006	0.002
N	416	416	416	416	416

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 82: Results of the linear regressions model - PCSE estimation with short time period

	(1)	(2)	(3)	(4)	(5)
Error	0.013	-0.013	-0.014	-0.014	0.000
	(0.046)	(0.045)	(0.045)	(0.046)	(0.046)
Rule	-2.083	0.794	4.690	10.791	11.321
	(38.912)	(38.921)	(38.124)	(34.134)	(33.970)
Election	1.723	0.646	3.462	1.447	3.368
	(16.875)	(16.543)	(17.023)	(15.412)	(16.123)
Coalition	19.588	16.042	13.344	19.967	25.816
	(25.426)	(24.612)	(24.274)	(26.314)	(26.135)
Concordance	-1.039	-0.902	-1.040	-0.570	-0.854
	(1.264)	(1.305)	(1.264)	(1.258)	(1.185)
Age	0.071	0.235	3.070	0.135	1.332
	(3.071)	(3.199)	(3.753)	(3.307)	(3.866)
Gender	49.444	38.435	33.544	23.515	28.835
	(63.878)	(67.239)	(69.235)	(69.129)	(62.018)
Balance	0.056**				0.053**
	(0.025)				(0.023)
Ideology		0.085			9.808
		(13.062)			(11.961)
Experience			-0.614*		-0.289
			(0.370)		(0.429)
Apprenticeship				-29.779	-29.250
				(60.123)	(55.849)
Economics				155.717**	147.785**
				(77.512)	(75.114)
Law				7.862	24.050
				(55.436)	(50.225)
Politics				14.411	29.892
				(170.856)	(167.359)
Constant	-	-	-73.532	-59.097	-
	-	-	(300.325)	(300.252)	-
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.288	0.272	0.277	0.291	0.309
Chi2	604.850	1152.440	693.460	998.310	875.590
p-value	0.000	0.000	0.000	0.000	0.000
N	416	416	416	416	416

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.

Table 83: Results of the linear regressions model - REGAR estimation with short time period

	(1)	(2)	(3)	(4)	(5)
Error	0.014	-0.014	-0.015	-0.017	0.001
	(0.056)	(0.057)	(0.055)	(0.055)	(0.057)
Rule	2.807	5.678	8.789	12.250	12.752
	(31.355)	(33.073)	(32.517)	(31.942)	(31.780)
Election	3.458	2.809	5.096	5.734	6.220
	(29.186)	(29.199)	(29.120)	(29.044)	(29.255)
Coalition	24.614	22.208	19.106	26.971	32.370
	(33.230)	(34.341)	(34.260)	(34.248)	(33.789)
Concordance	-1.280	-1.151	-1.287	-0.833	-1.040
	(1.216)	(1.257)	(1.259)	(1.224)	(1.210)
Age	0.538	0.859	3.203	0.779	0.966
	(2.873)	(2.965)	(3.502)	(2.873)	(3.484)
Gender	52.078	35.317	32.329	22.699	32.974
	(45.418)	(47.306)	(46.439)	(45.700)	(46.051)
Balance	0.062**				0.060**
	(0.026)				(0.026)
Ideology		1.257			9.811
		(15.439)			(15.163)
Experience			-0.505		-0.119
			(0.407)		(0.447)
Apprenticeship				-29.253	-33.606
				(61.044)	(61.159)
Economics				160.702**	153.037**
				(67.271)	(66.389)
Law				15.942	27.262
				(59.720)	(60.982)
Politics				35.368	53.113
				(115.654)	(115.422)
Constant	-12.053	-32.150	-94.479	-119.059	-184.796
	(210.153)	(228.153)	(215.591)	(222.673)	(253.600)
Cantonal FE	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES
R-Squared	0.007	0.118	0.007	0.148	0.167
F-stat	3.800	3.280	3.520	3.530	3.420
p-value	0.000	0.000	0.000	0.000	0.000
N	390	390	390	390	390

Parameter values appear without brackets and the standard deviation within. Asterisks denote the level of significance of parameter values: *** indicating significance at 1% level, ** at 5% level and * at 10% level. The R2 is the coefficient of determination. Results were computed with Stata 11 SE.