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**Assessing How Much Governmental Accounting
Standards Converge with IPSAS:**
A new methodology applied to Switzerland

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A new methodology applied to Switzerland

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Abstract

The aim of this paper is to suggest a new index-based methodology for more accurately measuring the convergence of governmental accounting standards with International Public Sector Accounting Standards (IPSAS) true and fair's approach. The study focuses on the case of Switzerland by assessing the accounting standards established by the 26 cantons under two major reforms implemented between 1980 and 2018. Using the MACBETH multiple criteria decision analysis, we show that weighting index criteria to assess the convergence of homegrown accounting standards improves the measurement. However, this does not substantially change the conclusions drawn from the results obtained by the different cantons when index criteria are all considered to be equally important.

Résumé

L'objectif de la présente étude est de proposer une nouvelle méthode basée sur la construction d'un indice afin d'améliorer la mesure de la convergence entre les normes comptables des collectivités publiques et l'approche 'true & fair' préconisée par les International Public Sector Accounting Standards (IPSAS). L'étude s'intéresse au cas de la Suisse en évaluant les normes comptables définies par les 26 cantons à l'occasion de deux réformes majeures introduites entre 1980 et 2018. Sur la base de la technique d'analyse multicritère MACBETH, nous montrons qu'en pondérant les critères comptables de l'indice utilisé pour mesurer la convergence entre les normes cantonales et les IPSAS, les résultats obtenus sont davantage précis. Pour autant, cela ne change pas substantiellement les conclusions tirées, par rapport à une situation où les critères comptables sont tous considérés d'égale importance.

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1. Introduction

Many accounting and financial reforms have been implemented over the past forty years to respond more effectively to growing demands concerning financial accountability and reliability in the international public sector (Guthrie et al., 1999). One of the main aspects of this gradual changeover in financial information management has dealt with governments' transition from the traditional cash basis to the modern accrual basis accounting at both national and local levels (Lapsley, 1999). Accrual accounting indeed provides a wide range of advantages for governments aiming to improve the transparency and comparability of their financial statements (Pina et al., 2009).

The development of the *International Public Sector Accounting Standards* (IPSAS) since 1997 has driven forward this modernisation process by providing public entities with a general framework for a harmonised application of accrual accounting principles. In 2018, 51% of governments who applied accrual accounting were said to report using IPSAS (IFAC & CIPFA, 2018). However, the governments are not legally required to adopt these international accounting standards, as long as their legislation does not render their implementation binding (IPSASB, 2018). The incorporation of IPSAS in national or local accounting systems therefore remains flexible, leading to heterogeneous levels of compliance. Indeed, IPSAS's specific framework remains little known by public actors and the adoption of these standards is often perceived as a constraint (Christiaens et al., 2015). Moreover, accounting reforms often vary in terms of content because they are influenced by a government's specific needs, beliefs, and preferences, or institutional contexts (Brusca & Condor, 2002 ; Pina & Torres, 2003 ; Christiaens et al., 2010). Harmonising public accounting systems therefore presents a significant challenge, as there is a little incentive for governments to improve their compliance with international standards and such efforts generally result from spontaneous initiatives.

Several studies have previously attempted to assess reformed accounting standards in national or local governments after their shift to accrual accounting. Yet the evidence was mainly based on rough methods of measurement and specific benchmarks that were not necessarily common and exploitable in other contexts (Christiaens, 1999 ; da Costa Carvalho et al., 2007). Other papers have intended to compare homegrown accounting standards directly with IPSAS (Brusca & Condor, 2002 ; Lüder & Jones, 2003 ; Benito et al., 2007). However, the main results presented in these studies remained descriptive and were limited to pointing out convergences and divergences without providing any robust quantitative evidence.

Measuring whether and how much governmental accounting converges or diverges from IPSAS is an important issue, since a better understanding of this process could help political

and public decision-makers easily appraise the compliance of applied standards to international requirements. This, in turn, could facilitate the implementation of further accounting reforms.

This paper offers an innovative methodology by designing an index that more accurately reflects how much governmental accounting standards converge with IPSAS's true and fair approach, i.e. enable a faithful presentation of financial information. It investigates whether relying on weighted index criteria improves the accuracy of the measurement without dramatically affecting how different governments rank according to their policies.

The methodology first involves identifying the different criteria used to assess the convergence of accounting standards with IPSAS *(identification step)*. Second, these criteria are weighted *(weighting step)* using the MACBETH technique, commonly used in the field of multiple criteria analysis. Then, the criteria are coded *(coding step)* in order to assess each government's homegrown accounting standards and eventually compute a convergence index score *(scoring step)*.

To test the empirical consistency of this proposal, the research was carried out in the suitable context of the 26 Swiss cantons, institutionally equivalent to provinces or states in other countries. Each Swiss canton has a high level of autonomy in terms of setting and using accounting standards. Moreover, the implementation of two major accounting reforms over the past forty years has enabled each Swiss canton to choose whether, and how, it wished to improve its standards. Switzerland therefore provides a unique research context by its spatial and temporal heterogeneity.

This research contributes to the international literature on public accounting standards. To the best of our knowledge, improving the methods used to measure accounting standards convergence has not yet been much studied.

The paper is organised as follows: we begin with a brief literature review dealing with the assessment of governmental accounting standards. The third section introduces the institutional context framing public accounting in Switzerland. Following that, the fourth section details the methodology used to design the convergence index. The fifth section provides the results obtained through our empirical investigations in the Swiss cantons. A final section is devoted to conclusions.

2. Literature review and main hypothesis

2a. Accounting standards convergence

Different terminologies are used in the literature to describe the phenomena related to recent changes in international public accounting. The notion of convergence is commonly used to describe the "movement [of an object] toward a point, [a state or a specific benchmark]" over time (Qu & Zhang, 2010, p.4). More precisely, it refers to the process undertaken by public entities in order to enhance the harmonisation (lesser diversity, greater homogeneity), or even further, the standardisation (uniformity) of accounting policies at the international level (Tay & Parker, 1990). All these notions yet indiscriminately refer to the evolution of public accounting standards toward a more homogeneous state[2].

As argued by Van der Tas (1988), accounting standards harmonisation may be either formal or material. Formal (de jure) harmonisation refers to the convergence of accounting standards defined by a government, or a standards' setting body, in laws, guidelines, recommendations, or in any other type of regulation. Material (de facto) harmonisation corresponds to the convergence of accounting practice, and focuses on how accounting standards are applied or used in practice.

Moreover, formal and material harmonisations may both relate either to the convergence of the accounting methods used to treat financial information (measurement harmonisation), or to the convergence of the level of financial information disclosure (disclosure harmonisation) (Canibaño & Mora, 2000).

Qu & Zhang (2010) mentioned the complementarity between these two notions, since formal harmonisation can constitute a first step toward material harmonisation by providing more coordinated standards to be applied. However, the authors also highlighted that improving formal standards does not necessarily favour the harmonisation of accounting practices if these standards offer a greater flexibility when applied.

2b. Methods for the measurement of accounting standards convergence

As emphasised by Pocrjnić & Pervan (2013) differentiating between formal and material harmonisation is crucial as their measurement requires distinct methodologies. Prior studies that focused on formal accounting harmonisation suggested statistical measurement models such as the Euclidian distance, Jaccard & Spearman coefficients, or fuzzy clustering analysis to measure the extent of convergence between different sets of national accounting regulations, or between national and international accounting requirements (see Adhikari & Tondkar, 1992 ; Lainez et

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[2] For practical issues, the notions of "convergence" and "harmonisation" are used as synonyms in the remainder of the paper.

al., 1996 ; Rahman et al., 1996 ; Garrido et al., 2002 ; Fontes et al., 2005 ; Qu & Zhang, 2010 ; Dasí González et al., 2018)[3].

Other papers focused instead on the measurement of material harmonisation. In these cases, convergence was generally measured using an index constituted of several accounting items or criteria. This method was first proposed by Van der Tas (1988) who defined three indices (H, C and I) to evaluate the concentration of accounting methods applied (measurement harmonisation) when reporting defined items in financial statements, in both national and international contexts (see Archer et al., 1995 ; Hermann & Thomas, 1995 ; Morris & Parker, 1998 ; Aisbitt, 2001 ; Pierce & Weetman, 2002 ; Taplin, 2004). Other methodological extensions were then proposed in order to measure the harmonisation of accounting practices according to specific requirements, generally emanating from reformed national or local governmental accounting systems (see da Costa Carvalho, 2007).

Some papers concentrated on material harmonisation and the degree of financial disclosure arising from the accounting practices applied by the governments. Ingram's (1984) disclosure index for instance inspired several studies intending to measure how harmonised the presentation of specific accounting elements was in financial statements (measurement harmonisation) (see Giroux, 1989 ; Cheng, 1992 ; Volmer, 1992 ; Allen & Sanders, 1994 ; Christiaens, 1999 ; Stanley et al., 2008). But again, these elements were usually defined and evaluated according to national or local accounting requirements.

The index method of measurement may be further improved, as the items used to determine how identical or compliant accounting methods are, are generally set and evaluated according to country-specific standards. The absence of an international framework for assessing governmental accounting standards, based on a common benchmark or accounting reference, makes it difficult to compare and generalise the scope of the results.

2c. Index method of measurement: Criteria weighting issue

Most studies using an index method of measurement to assess accounting standards convergence assumed that the different accounting criteria considered were of equal importance, mainly for practical purposes. Equal weightings or no weightings at all were consequently assigned to all of them. Ignoring the potential differences of importance between criteria may however have reduced the measurement's accuracy.

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[3] In light of their many similarities, the presented concepts apply without distinction to public and private sector accounting literature.

To our knowledge, only Robbins & Austin (1986) have taken a real interest in this issue. The authors indeed proposed a sophisticated compound index of disclosure which aimed to capture not only the convergence of disclosure accounting practices, but also the importance of the different criteria considered when assessing the overall quality of financial reports in US municipalities. Criteria were weighted with a magnitude scaling technique. US municipal bond analysts were asked to rate each criterion according to their perceived importance. However, results were not statistically different from those computed with a simple index of disclosure, where the importance of the different criteria was not taken into account, i.e. criteria were not weighted at all. Only a few studies have replicated this method but without providing any robust evidence (see Ingram & DeJong, 1987).

Weighted items may be used so rarely because criteria are often valued differently by the individuals involved (e.g. professional accountants, financial statements users, politicians, researchers, etc.). This value depends for instance on their interests and their own perceptions, as mentioned by Hasson & Marston (2010). Therefore, results are often inconclusive or not sufficiently representative because they are influenced by the profile of the people solicited for the weighting procedure.

Additionally, the criteria used to assess the convergence of accounting methods are generally qualitative, implying that they "do not support [direct] algebraic operations, such as sums or products" (Santos, 1998, p. 25). The assignment of a numerical evaluation accurately reflecting the importance of each criterion therefore becomes a matter of appreciation, of judgement, and again, results from the weighting procedure are highly subjective (Soguel et al., 2007).

Multiple criteria decision analysis techniques may be a solution for this kind of complex decision-making process involving subjective judgments or comparisons. Thus far, decision analysis techniques have yet never been considered in the accounting research field for solving these methodological challenges.

For instance, the MACBETH (Measuring Attractiveness by a Categorical Based Evaluation Technique) multiple criteria decision analysis only requires verbal judgements to help a single decision-maker, or several, quantify the relative importance of multiple options (Bana e Costa et al., 2003). This method makes it possible to "valid[ate] comparative judgements by checking theoretical and semantic consistency" (Salomon & Montevechi, 2001 as cited in Soguel et al., 2007, p. 832).

2d. Main hypothesis

Using IPSASs as a benchmark for measuring the convergence of government accounting standards could help to solve issues related to the generalisability of results. This may also be particularly useful for assessing the harmonisation of public accounting in an international perspective. Finally, considering IPSAS's requirements as a reference may help better determine how much a government's accounting methods enable a faithful presentation[4] of their financial information.

On the other hand, assigning a weighting factor to the different accounting criteria used for convergence assessment may improve the accuracy of the measurement. However, the weak evidence shown in previous research indicates that small variations in overall results should be expected.

In light of this, we formulate the following main hypothesis: ***Using weighted index criteria when assessing the convergence of accounting standards with IPSAS improves the accuracy of the measurement without dramatically affecting how different governments rank according to their policies.***

3. Context of public accounting in the Swiss cantons

Switzerland's federalist structure means the country is organised into three distinct institutional levels: the Confederation (central government), the 26 cantons (federal States), and their municipalities (local governments).

Public finances and accounting policy matters are managed autonomously by the cantons. Concretely, each canton establishes its own Financial Management Act of Parliament (FMAP) in which it defines its fiscal organisation and process, as well as the standards to be used for preparing and presenting its financial statements.

This institutional setting has fostered the development of diversified accounting standards at the subnational level. For instance, in the mid-1960s, several cantons were already using accounting models inspired by the private sector and close to accrual accounting, i.e. using an income statement and a statement of financial position, for instance. By contrast, other cantons were favouring the traditional cash basis accounting, in the same way the central government did.

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[4] As stated in the IPSASB Conceptual Framework, "faithful representation is attained when the depiction of the phenomenon is complete, neutral, and free from material error. Information that faithfully represents an economic phenomenon depicts the substance of the underlying transaction, other event, activity or circumstance-which is not necessarily always the same as its legal form" (IPSASB, 2018, p. 49).

3a. HAM1 reform

The Swiss cantons attempted a few times to coordinate their accounting policies, but without success. However, in the early 1970s, requirements for transparency, comparability and accountability became increasingly prominent in the public sector, notably influenced by the 'New Public Management' (NPM) movement.

In 1977, the intercantonal Conference of the Cantonal Finance Ministers (CFM)[5] took the initiative to design a first Harmonised Accounting Model (HAM1) and to suggest it be implemented by the cantons (CFM, 1981). The CFM is a gathering organised in order to discuss and coordinate the cantons on fiscal matters when necessary. It has no power to impose and can only recommend. Therefore, the cantons were free to adopt HAM1 and, if so, to determine the extent to which they would conform to it.

The heart of HAM1 consisted of a detailed chart of accounts that was accompanied by proposals for its use to prepare and to present both the budget plan (beginning-of-the-year) and the financial statements (end-of-the-year), but also the multi-year financial plan. Due to cantonal sovereignty, this first reform towards accounting standards harmonisation was a slow process. It took almost until the late-1990s for HAM1 to be implemented by all the cantons (see Appendix 1); its application was, however, quite varied.

3b. HAM2 reform

Beginning in the mid-2000s, various sources of pressure started stemming from both central and subcentral levels of government where a better knowledge of the cost of public goods and services provision was becoming essential. Moreover, IPSASs had been gradually made available in the meantime. International capital markets were also asking for financial statements to be prepared in a more standardised way.

Following this succession of events, the CFM undertook to design an updated version of HAM1. The second-generation of the Harmonised Accounting Model (HAM2) was released in 2008 and remains currently in force (CFM, 2008). The revised chart of accounts has remained central in HAM2. It has henceforth gone hand in hand with 20 standards established as recommendations the cantons may adopt or not. These standards were explicitly inspired by the IPSAS and their principle of true and fair accounting. However, on several points, - some ten in all, - these standards have offered the cantons alternative accounting policies (e.g. linear or degressive depreciation ; the possibility but not the obligation to restate the assets when

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[5] 'Konferenz der kantonalen Finanzdirektorinnen und Finanzdirektoren' (FDK) in German and 'Conférence des directrices et directeurs cantonaux des finances' (CDF) in French.

introducing HAM2 ; the possibility of some forms of political finessing when preparing the financial statements). By providing alternatives to a strictly aligned IPSAS version, the CFM issued standards that were able to satisfy two broad categories of cantons with possibly competing goals: *(a)* the cantons that wished their financial statements to give a faithful representation of their financial condition; *(b)* the cantons that wished to follow a political and prudent approach in their financial management, at the expense sometimes of a sincere and regular presentation of their financial statements.

By 2018, all cantons had introduced HAM2. However, each canton took advantage of the different alternatives offered.

4. Methodology

4a. Assessment criteria identification

The empirical investigation needed to first identify the different criteria used to measure the extent to which the accounting policies of the Swiss cantons already converged with IPSAS's true and fair approach. To this end, 15 assessment criteria were derived from the various points where HAM2 offered formal alternatives to IPSAS in terms of implementation (cf. section 3b)[6].

When the CFM designed HAM2, the alternatives to IPSAS approach were not coming from nowhere. They had been requested by the cantons that had privileged traditional accounting policies under HAM1 and that wished to maintain their use after implementing HAM2. This implies that the same criteria can be utilised to evaluate the set of accounting policies selected by the cantons under both HAM1 and HAM2 reforms.

Table 1 presents the identified criteria ranked in decreasing order, according to their importance, as detailed in the next section. Moreover, the table tentatively mentions whether a deviation from the corresponding criterion affects the presentation of the financial performance (balance sheet), the presentation of the financial position (income statement), or both.

Of course, at the end of the day, almost every single criterion affects the statement of financial position. However, both HAM1 and HAM2 put a much stronger emphasis on the statement of financial performance than on the statement of financial position. Therefore, one can expect the criteria that primarily affect the financial performance to outweigh those that rather influence the financial position.

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[6] These are also the control points used by the Swiss Public Sector Financial Reporting Advisory Committee (SRS), the body that revises and sets the standards on behalf of the CFM since 2008.

Table 1 – Criteria for assessing the convergence between Swiss cantons' accounting standards and IPSAS

	Criteria	Mainly affected element
1	Use of accrual rather than cash basis accounting principles	Performance & Position
2	Absence of additional depreciation charges (i.e. no political finessing)	Performance
3	Absence of annual performance smoothing, e.g. using rainy-day funds (i.e. no political finessing)	Performance
4	Absence of pre-financing (i.e. no political finessing)	Performance
5	Linear depreciation method, over useful life rather than degressive depreciation	Performance
6	Accrual recognition of tax revenues	Performance
7	Measurement of non-administrative assets at market value rather than at historical cost	Position
8	Start of depreciation as soon as the asset is available for use	Performance
9	Low threshold for the recognition of capital expenditures in the statement of financial position	Performance & Position
10	Low threshold for accruals and deferrals of past or future revenues and charges	Performance
11	Separate recognition of capital expenditures from the obtained grants to finance them	Position
12	Use of financial indicators	Performance & Position
13	Separate recognition of plots of land from buildings erected on them	Position
14	Measurement of administrative assets at market value rather than at historical cost	Position
15	Presentation of a cash flow statement in accordance with IPSAS	Position

4b. Assessment criteria weighting

The identified criteria may all be of equal importance for assessing the convergence of Swiss accounting standards with IPSAS, but they may not be. A simple way to address the problem could be to score each criterion using a standard scale of 1 (not important) to 10 (very important), or to allocate percentages among the criteria, with the most important criterion allocated the larger percentage-points. However, these solutions are too rough and hasty to allow for a thoughtful elicitation of weightings. Moreover, as discussed in the literature review, the validity of the weighting procedure is highly dependent on the profile of the respondents.

Given these issues, we solicited six members of the Swiss Public Sector Financial Reporting Advisory Committee (SRS)[7]. As members of the SRS, these persons are highly knowledgeable of accounting standards and strongly aware of the impact of fulfilling each individual criterion on the reported financial performance and position of the Swiss cantons. At the same time, they have a technical view of the issue and no political interest.

We then relied on the MACBETH multiple criteria decision analysis technique which consists in ranking the different criteria ordinally and comparing their importance pairwise. Indeed, the combination of these two stages makes the information consistent enough to achieve numerical evaluations that can properly be considered as weightings (Soguel et al., 2007).

According to this technique, each expert was interviewed individually and asked to classify the different criteria in decreasing order of importance[8] (*1st rank for the criterion of highest importance through 15th rank for the criterion of lowest importance*), with equal rankings allowed. Secondly, each expert was asked to assess the difference in importance between each criterion and the one immediately ranked below, by means of the following verbal statements : *"null", "very weak", "weak", "moderate", "strong", "very strong" or "extreme" difference in importance*[9] (see Figure 1). The MACBETH algorithm then enabled us to verify the consistency of responses provided by the experts and to compute the weightings they individually attributed to each criterion[10].

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[7]   The six interviews were performed in 2019 during the 3rd Public Sector Standard Setters Forum, organised by the IPSAS board and the Canadian Public Sector Accounting Board, in Niagara-on-the-Lake, in June 24-25.

[8]   The question designed to underpin the process of reflection was: *What is important to ensure a faithful representation of a governmental financial situation (i.e. financial position and performance)?*

[9]   To prevent the experts from considering the last criterion of their ranking (15th) as insignificant by default, its importance was systematically compared with a fictitious (16th) criterion whose value was defined as null.

[10] For practical issues, average weighting values are used in the next part dedicated to the presentation of our results.

Figure 1 - Example of an individual weighting procedure scheme. Source: own illustration[11]
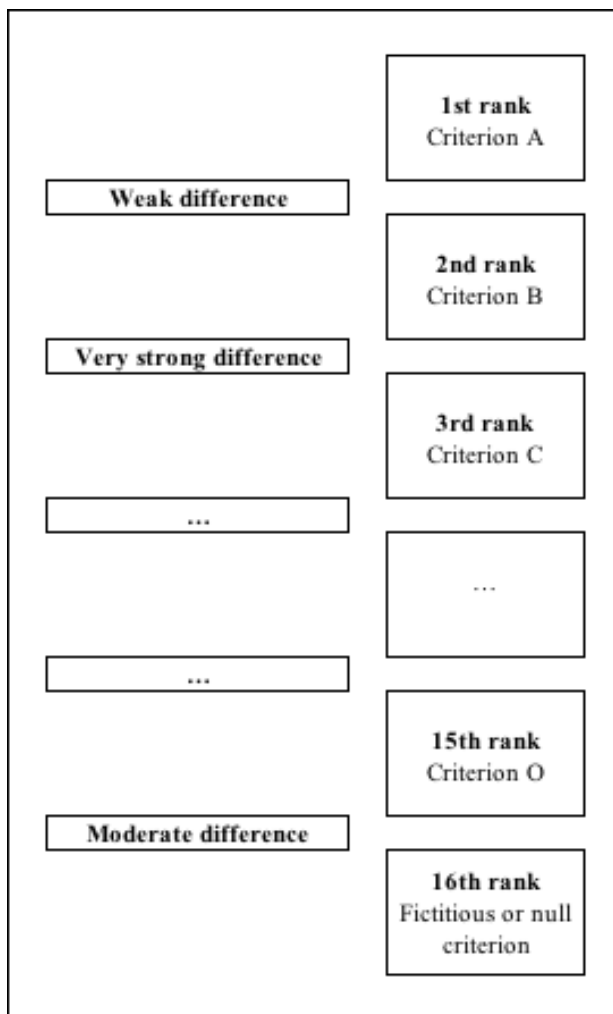
4c. Data collection and assessment criteria coding

The accounting standards set by the Swiss cantons under HAM1 had never been officially reported[12]. These data were therefore collected via questionnaire. The latter was composed of 22 multiple-choice questions. The choices corresponded to the different alternatives provided for the application of each of the 15 criteria (see Appendix 2). The PDF-format questionnaire was designed to be self-administered by respondents. The document was sent in December 2018 by mail to the 26 Cantonal Finance Department Senior Budget Officers, either in a French (French and Italian-speaking cantons) or in a German version (German-speaking cantons). The response rate was 100%, within the allocated two-months deadline. As for the standards defined by the cantons under HAM2, information was collected on the SRS' public website[13].

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[11] Each criterion and each verbal statement were presented in card form in order to facilitate their handling during the process.

[12] In Switzerland, the accounting standards set by the cantons are legally binding. Therefore, no deviations should exist between how accounting standards are defined and how they are used in practice by the cantons. The terms of accounting 'standards' and accounting 'practices' or 'policies' are therefore considered synonyms in the remainder of the analysis.

[13] See https://www.srs-cspcp.ch

Various scaling formats were then used for coding the different criteria (see Appendix 2). Scales were either dichotomous, discrete, or continuous. However, they were always bounded over a closed and increasing interval extending from 0 to 1, i.e. from 0% to 100%. For each criterion, a maximum value of 1 was attributed to a canton whose accounting policy was fully in line with the approach advocated by IPSAS, or 0 if totally opposed.

4d. Computation of index scores

After coding each canton's accounting standards, the resulting values were multiplied by the weighting associated to each criterion. Index scores were then computed for each canton by summing up the 15 weighted values. With such a system, a modern canton that defined its accounting standards in accordance with IPSAS obtained a score close to 100% (high convergence with IPSAS), whereas a canton with a conservative approach of public finance management displayed a score closer to 0% (low convergence with IPSAS). This process was performed separately for both HAM1 and HAM2 reforms. Moreover, for the sake of comparison, scores were also computed with equally weighted (i.e. unweighted) criteria.

5. Results

5a. Weighted assessment criteria

Table 2 presents a statistical summary of the results of the weighting procedure carried out by the six interviewed SRS-members. Assessment criteria are ranked in decreasing order of importance according to the average weightings assigned to them.

Table 2 – Results of the assessment criteria weighting procedure, in percentage

Rank	Criteria	Mean	Median	Std. Dev.	Min.	Max.	Nb>6,67
1	Use of accrual rather than cash basis accounting principles	12,45	12,57	10,30	14,62	1,46	6
2	Absence of additional depreciation charges (i.e. no political finessing)	9,97	10,47	7,84	11,11	1,24	6
3	Absence of annual performance smoothing, e.g. using rainy-day funds (i.e. no political finessing)	9,45	9,62	7,75	11,11	1,44	6
4	Absence of pre-financing (i.e. no political finessing)	8,60	9,20	4,88	10,77	2,06	5
5	Linear depreciation method, over useful life rather than degressive depreciation	6,79	6,89	5,38	7,75	0,77	5
6	Accrual recognition of tax revenues	6,77	7,28	1,79	9,76	2,91	4
7	Measurement of non-administrative assets at market value rather than at historical cost	6,67	6,55	3,85	8,74	1,88	3
8	Start of depreciation as soon as the asset is available for use	6,14	6,73	3,85	7,04	1,23	4
9	Low threshold for the recognition of capital expenditures in the statement of financial position	6,03	6,01	4,07	7,95	1,33	2
10	Low threshold for accruals and deferrals of past or future revenues and charges	5,95	5,51	4,07	7,84	1,42	2
11	Separate recognition of capital expenditures from the obtained grants to finance them	5,35	4,64	2,56	8,67	2,37	2
12	Use of financial indicators	4,58	4,45	1,96	7,86	2,07	1
13	Separate recognition of plots of land from buildings erected on them	4,15	3,85	2,44	6,86	1,48	1
14	Measurement of administrative assets at market value rather than at historical cost	3,88	3,95	0,77	6,92	2,74	2
15	Presentation of a cash flow statement in accordance with IPSAS	3,22	2,98	0,26	7,69	2,57	1

All the assessment criteria are unanimously considered relevant to ensure a faithful presentation of a government's financial situation (i.e. financial position and performance). Indeed, all of them get a mean weighting greater than 0%. However, we do observe disparities in terms of the importance between the different criteria. For instance, the 'absence of additional depreciation charges (i.e. no political finessing)' is considered a significant criterion for ensuring financial faithfulness (9,97/100%), whereas the 'presentation of a cash flow statement in accordance with IPSAS' is relegated to the background and is not considered to be central (3,22/100%).

Criteria at the bottom half of the ranking (7 to 15) have smaller intervals for weighting values and lower standard deviations. This suggests that the consensus of opinions between the different experts is stronger for criteria of lesser importance.

Nevertheless, median and mean values are generally close, which shows that only a few respondents had a minority view of the different criteria. This latter observation is corroborated by the final column of the table that shows how many of the six respondents over- or underweighted each criterion. Indeed, if they had all been considered equally important, each of the 15 criteria should have been assigned an identical weighting of 6,67%, corresponding to a total score of 100% across all criteria. Yet, respondents unanimously overweighted criteria 1, 2 and 3 and, significantly, criteria 4 to 8. On the other hand, criteria 9 to 15 were underweighted by most of the participants. Moreover, almost every overweighted criteria chiefly target the presentation of financial performance, whereas underweighted criteria are related to the presentation of financial position, in accordance with what was recommended by HAM1 and HAM2.

This indicates that these preliminary findings show the relevance of using differently weighted criteria when measuring convergence of accounting standards with IPSAS in the Swiss context.

5b. Overall coded scores per assessment criteria

Table 3 shows a statistical summary of the coded scores achieved by the Swiss cantons for each assessment criterion under HAM1 and HAM2. In this table, criteria are ranked in descending order, according to mean coded scores performed by the cantons under HAM2. The first column is intended to remind the order in which criteria are presented in Table 2.

A mean value close to 1,00 indicates that most of the cantons applied the criterion in a manner fully consistent with IPSAS. In turn, a mean value close to 0,00 indicates that most of the cantons opted out of the recommended policy when defining their own accounting method. Under the two HAMs, the 'use of accrual rather than cash basis accounting principles' criterion

shows a mean score of 1,00 because, regardless of the extent, it is fulfilled by all 26 cantons. However, several other criteria (ranked 9, 10, and 12) show high mean values in a range between 0,86 and 0,95 under HAM1 already. In these cases, most of the Swiss cantons adopted accounting policies that were much in line with the approach emphasised by IPSAS[14]. By contrast, in four cases (criteria ranked 2, 8, 11 and 13), the Swiss cantons achieve much lower mean values in a range between 0,10 and 0,25. Each of these results is combined with a median value of 0,00, indicating that a majority of the cantons opted for prudent accounting policies in those cases under HAM1. Eventually, two criteria, respectively the 'presentation of a cash flow statement in accordance with IPSAS' and the 'measurement of administrative assets at market value rather than at historical cost' show a mean value of 0,00. In these cases, the first reform did not, by and large, enable a definition of accounting methods that enhanced the faithfulness of financial information. In fact, these two accounting standards were not subject to any kind of recommendation under HAM1 reform and have been introduced subsequently with HAM2 reform.

From HAM1 to HAM2, a rise in the average of mean and median values is observed, respectively from 0,46 to 0,67 and from 0,47 to 0,73. Considering that the HAM2 reform was meant to substantially enhance cantonal convergence of accounting standards towards IPSAS, this overall improvement is in line with our expectations. In some cases (criteria ranked 2, 5, 7, 8, 15), the increase in mean and median values is significant. However, in several other respects, results are more mixed. For instance, the Swiss cantons still achieve low results for criteria ranked 11 and 14 after the second reform. In a few exceptional cases (criteria ranked 3, 9, 10), some cantons have even slightly relaxed their standards when implementing the second reform. Mean and median values are consequently lower under HAM2. However, standard deviation values indicate that the dispersion of scores remains on average the same after HAM1 and HAM2 reforms.

The main contribution of this table is that criteria that are best fulfilled by the Swiss cantons are not necessarily those considered of greatest importance, or relevance, when assessing the faithfulness of financial information, and vice versa (see ranks from Table 2). A good example is provided by the 'use of financial indicators' criterion. The latter is unanimously fulfilled by the Swiss cantons under HAM2 but is still considered of minor importance for assessing

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[14] Both criteria assessing the level of the thresholds for the recognition of capital expenditures, or for accruals and deferrals, show high values. The fact that these criteria are relative and continuous explains the outcome. Some cantons used or still use a very high threshold (even though computed per capita). Therefore, other cantons, using a more reasonable or low threshold, get high value for these criteria. This skewed distribution is also reflected in the median value.

convergence with IPSAS (rank 12). Inversely, the 'absence of additional depreciation charges (i.e. no political finessing)' criterion remains far from being fulfilled, even after HAM2 reform. However, it is ranked as the second most important criterion in Table 2. The differences in achievement for these two accounting standards is explained by the variable ease of their application, but also by the fact that they pursue different objectives.

Table 3 – Swiss cantons' coded scores per assessment criterion under HAM1 and HAM2, in points

Rank Tab.2	Criteria	HAM1			HAM2		
		Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
1	Use of accrual rather than cash basis accounting principles	1,00	1,00	0,00	1,00	1,00	0,00
12	Use of financial indicators	0,88	1,00	0,33	1,00	1,00	0,00
7	Measurement of non-administrative assets at market value rather than at historical cost	0,54	0,75	0,49	0,96	1,00	0,20
10	Low threshold for accruals and deferrals of past or future revenues and charges	0,95	1,00	0,20	0,89	0,99	0,23
15	Presentation of a cash flow statement in accordance with IPSAS	0,00	0,00	0,00	0,85	1,00	0,24
5	Linear depreciation method, over useful life rather than degressive depreciation	0,37	0,50	0,38	0,82	1,00	0,28
9	Low threshold for the recognition of capital expenditures in the statement of financial position	0,86	0,95	0,24	0,79	0,90	0,27
6	Accrual recognition of tax revenues	0,60	0,50	0,28	0,65	0,50	0,24
8	Start of depreciation as soon as the asset is available for use	0,19	0,00	0,40	0,65	1,00	0,49
2	Absence of additional depreciation charges (i.e. no political finessing)	0,10	0,00	0,25	0,58	0,50	0,39
13	Separate recognition of plots of land from buildings erected on them	0,25	0,00	0,43	0,58	1,00	0,48
3	Absence of annual performance smoothing, e.g. using rainy-day funds (i.e. no political finessing)	0,58	1,00	0,50	0,54	1,00	0,51
4	Absence of pre-financing (i.e. no political finessing)	0,40	0,33	0,41	0,41	0,00	0,48
11	Separate recognition of capital expenditures from the obtained grants to finance them	0,15	0,00	0,37	0,19	0,00	0,40
14	Measurement of administrative assets at market value rather than at historical cost	0,00	0,00	0,00	0,08	0,00	0,27
	Total average of mean and median values	**0,46**	**0,47**	**0,29**	**0,67**	**0,73**	**0,30**

Financial indicators are support instruments used by the cantons to ensure the soundness of their fiscal management and to provide a clear picture of their financial situation, while relying on precise and comparable information. But their use does not imply any particular constraint. In contrast, additional depreciation charges are a creative accounting tool usually used by finance ministers to conceal positive imbalances in the statement of financial performance (i.e. excessive surpluses) by increasing operating expenses. They do this because otherwise, the citizens, as taxpayers, may consider that the amount of taxes collected has exceeded expenditures, or that the annual provision of public services was insufficient. In turn, reporting a balanced statement of financial performance may help justify maintaining higher taxes rates and limiting public spending which could subsequently contribute to reducing public debt (Clémenceau & Soguel, 2018). The elbow room this accounting gimmick offers may be the root of the success of this policy in the Swiss cantons. However, according to the experts, this severely compromises the transparency of information provided in financial statements.

5c. Computed index scores

Table 4 presents the index scores of the Swiss cantons under both HAMs. For comparative purposes, results are computed with weighted or unweighted criteria. Moreover, the Swiss cantons are ranked in descending order, according to the scores they achieved under HAM2 with weighted criteria. As a reminder, a score close to 100% reflects a high level of convergence between that canton's accounting policy and IPSAS, whereas a score closer to 0% indicates that the canton is far from fulfilling IPSAS requirements.

None of the Swiss cantons obtain a score of 0%. In spite of the disparities in results, the 26 cantons have all taken care to define accounting standards which, to one extent or another, enable a faithful representation of their financial situation. When index scores are computed with weighted criteria, it appears that under HAM1, the lowest index score is 26,37% (canton of SH), whereas the highest one is 87,92% (canton of GE). Under HAM2, scores are pulled upwards as the lowest value reaches 40,71% (canton of ZG) and the highest one 99,97% (canton of ZH). Increasing mean values also indicate that the accounting standards of the Swiss cantons are more in line with IPSAS's approach after the second reform.

In this way, BS and GE are the only cantons that reached a score above 80% under HAM1. Then, ZH, LU and SO join this level under HAM2. Moreover, of 15 cantons with an index score lower than 50% under HAM1, only 3 of them still remain in this situation under HAM2. As an exception, the canton of ZG falls into this category only after the second reform.

Table 4 - Index scores for each of the 26 Swiss cantons under HAM1 and HAM2, as a percentage

Cantons		HAM1		HAM2	
		Weighted criteria	Unweighted criteria	Weighted criteria	Unweighted criteria
Zurich	ZU	48,00	42,18	99,97	99,97
Basel City	BS	84,42	79,88	95,91	93,10
Luzern	LU	53,46	48,76	95,91	93,09
Geneva	GE	87,92	83,33	90,55	93,33
Solothurn	SO	66,56	59,89	87,22	83,15
Basel Land	BL	42,45	40,00	80,45	79,04
Graubünden	GR	48,01	42,77	76,89	74,56
Aargau	AG	48,63	45,25	74,70	74,05
Bern	BE	45,51	45,52	73,72	77,27
Schwyz	SZ	50,04	42,87	71,11	69,43
Neuchâtel	NE	66,94	63,53	69,17	69,82
Appenzell A.	AR	43,26	40,67	65,37	63,29
Ticino	TI	56,10	52,99	64,45	59,49
Schaffhausen	SH	26,37	23,33	60,64	63,93
Freiburg	FR	46,22	38,14	59,85	55,78
St. Gallen	SG	45,64	40,15	59,22	54,63
Jura	JU	54,20	47,73	58,82	56,42
Uri	UR	52,21	45,27	58,07	58,24
Thurgau	TG	38,85	36,42	57,03	56,32
Nidwalden	NW	45,01	40,01	55,41	54,53
Glarus	GL	32,41	30,00	55,30	56,67
Vaud	VD	47,91	42,53	54,53	52,15
Valais	VS	51,35	45,47	50,21	56,08
Appenzell I.	AI	32,41	30,00	49,54	48,18
Obwalden	OW	33,95	29,33	40,80	43,26
Zug	ZG	59,39	52,08	40,71	42,36

Statistics

		Weighted criteria	Unweighted criteria	Weighted criteria	Unweighted criteria
Observations		26	26	26	26
Mean		50,28	45,70	67,14	66,47
Median		48,01	42,82	62,55	61,39
Standard deviation		14,28	13,82	16,64	16,19
Minimum		26,37	23,33	40,71	42,36
Maximum		87,92	83,33	99,97	99,97

When index scores are computed with unweighted criteria, values are lower on average under both HAMs. However, the general conclusions we can draw under this alternative setting do not change much from those we have already mentioned. This implies that relying on weighted criteria when assessing cantonal accounting standards does not change the overall picture, but it improves the assessment of convergence, as index scores individually achieved by the Swiss cantons are measured more accurately.

Graph 1 - Evolution of cantonal index scores computed with weighted assessment criteria between HAM1 and HAM2, as a percentage
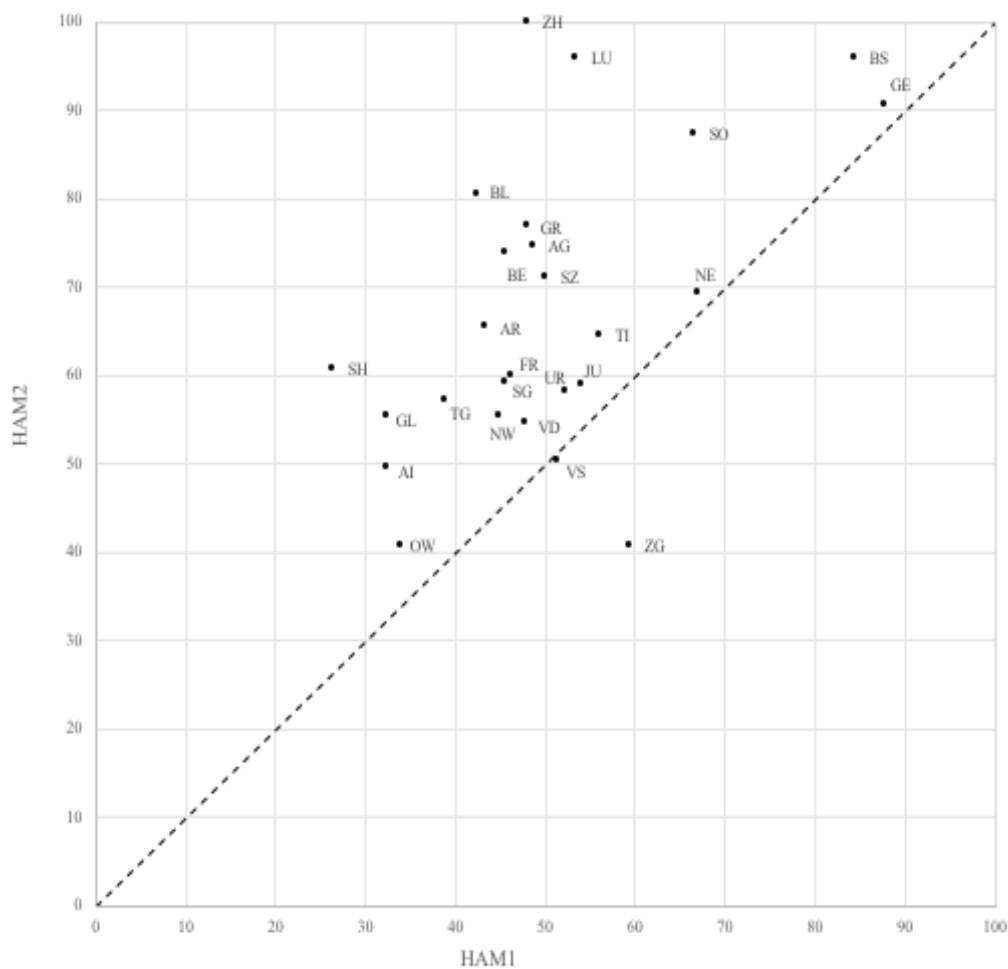
Graph 1 illustrates the evolution of each canton's index score computed with weighted criteria between HAM1 (horizontal axis) and HAM2 (vertical axis). The dotted bisecting line shows where a canton should stand if its score remained unchanged between the first and the second reform. GE and NE follow this latter pattern as they hardly improved their standards when implementing the second reform. Nevertheless, many cantons above the bisecting line did increase their standards under HAM2, sometimes dramatically (ZH, LU, BL, SH). In three cantons (BS, GE, SO), the accounting standards defined under the first reform already made a

certain level of faithful financial presentation possible. But all of them further improved their standards under the second reform. In contrast, VS and ZG scores decreased between the first and the second reform which indicates they may have loosened some of their standards. These two cantons are therefore plotted under the bisecting line[15]. With a few exceptions, Graph 1 further demonstrates the favourable evolution of cantonal accounting standards towards a more faithful presentation of their financial information, in line with IPSASs requirements. However, the cantons that achieved low scores under HAM1 should have benefited from a bigger room for improvement than those whose scores were already high. But according to the results presented in Table 4, HAM2 reform does not seem to have greatly impacted the rankings. This means that the cantons that had the most consistent accounting policies under HAM1 are also those that converged the most with IPSAS approach under the HAM2 reform.

5d. Robustness checks

The results presented so far validate the relevance of our main hypothesis that the use of weighted criteria *(a)* improves the accuracy of assessing accounting standards convergence, *(b)* but does not dramatically affect how different governments rank. However, our methodology needs further robustness checks.

Graph 2 illustrates the different impact of using weighted or unweighted criteria on index scores under HAM1 (grey squares) and HAM2 (black dots). Scores are computed either with unweighted criteria (horizontal axis) or with weighted criteria (vertical axis).

As scores are very close under both settings, HAM1 grey squares and HAM2 black dots should not depart from the bisecting line. But obviously, this is not exactly the case. The fact of considering weighted values increases the index scores of 25 cantons under HAM1, for 17 cantons under HAM2. By contrast, it decreases the score of only 1 canton under HAM1, against 9 cantons under HAM2. In the first case, grey squares and black dots are plotted above the bisecting line, whereas in the second one, they are plotted beneath.

The quantitative impact of weighting index scores is variable: the largest reduction amounts to 0,01 percentage points (or pp) (HAM1) and 6 pp (HAM2), whereas the largest increase is respectively 8 pp and 5 pp. The mean of the impact is 4,58 pp (HAM1) and 0,67 pp (HAM2) in absolute terms[16]. Differences in scores are therefore more pronounced under HAM1 reform.

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[15] This comment should be amended when scores are computed with unweighted criteria (see Appendix 3). In this case, only the canton of ZG is plotted under the bisecting line.

[16] A boxplot graph in Appendix 4 gives more detailed information.

Results from a paired sample t-test besides indicate that index scores computed with weighted criteria are significantly different from those computed with unweighted criteria under HAM1 (see Appendix 5). The improved consistency in the measurement of Swiss accounting standards convergence is thus verified when scores are computed with weighted criteria.

Graph 2 – Comparison between cantonal index scores computed with weighted or unweighted assessment criteria under HAM1 and HAM2, in percentage
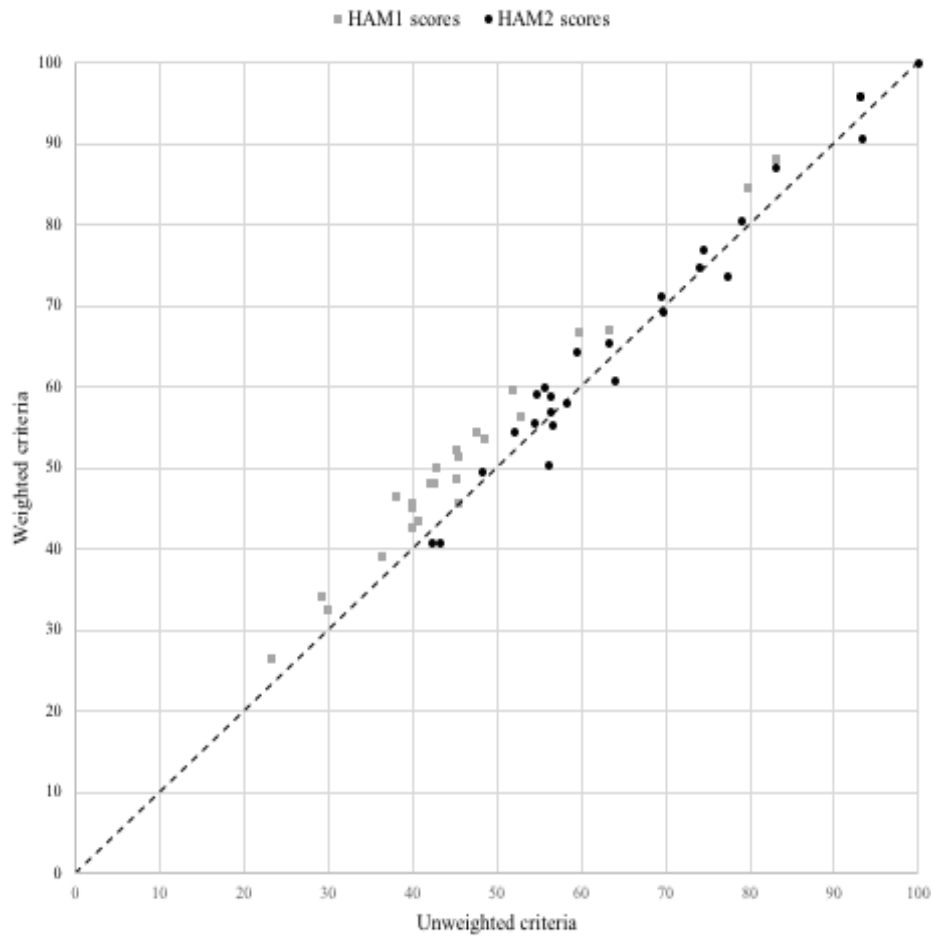

Graph 3 illustrates the comparison of cantonal ranking according to their scores computed with unweighted (horizontal axis) or weighted (vertical axis) criteria. Rankings are quite similar under both settings, as most of the points are plotted close to, or even on the bisecting line under the two HAMs.

Spearman rank correlation coefficients shown in Appendix 6 also indicate that cantonal ranking, based on scores computed either with weighted or unweighted criteria, are positively and strongly correlated under HAM1 (0,95) and HAM2 (0,96). This implies that a top-scoring canton where weighted values are considered is very prone to be highly ranked when scores are

computed on unweighted values, and vice versa[17]. Therefore, the use of weighted values does not much change the cantonal rankings.

Graph 3 – Cantonal ranking arising from index scores computed with weighted or unweighted assessment criteria under HAM1 and HAM2

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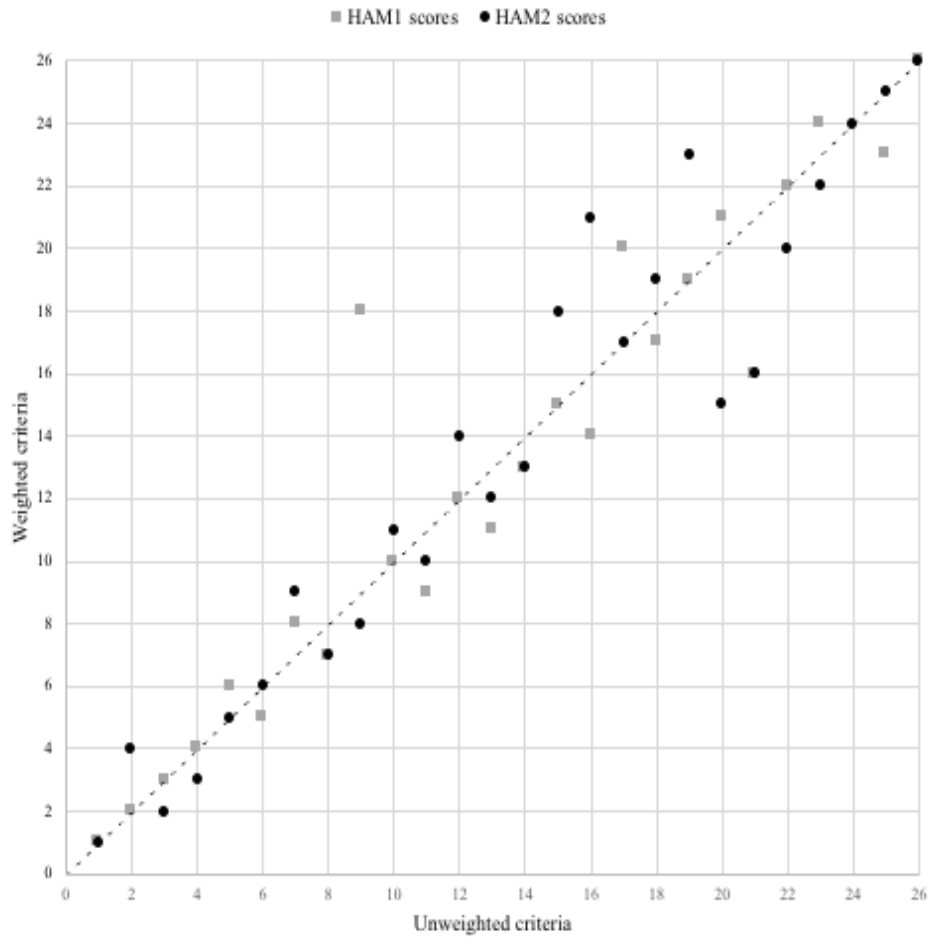
[17] A statistical significance test was performed in order to check the robustness of our results (see Appendix 6). However, we must remain cautious in our interpretation since our observations are not based on a random sample.

6. Conclusion

The aim of this article was to establish a new index-based methodology of measuring how much governmental accounting standards converge with IPSAS's true and fair approach, i.e. enable a faithful presentation of financial information. More precisely, it has investigated whether relying on weighted index criteria improves the accuracy of governments' estimated scores of convergence without dramatically affecting how they rank according to their individual achievement.

Using the context of the 26 Swiss cantons, we identified 15 criteria in order to assess the accounting standards set individually by each entity under two major reforms. In order to account for the fact that the different accounting criteria considered do not necessarily contribute with the same intensity to the faithfulness of financial information, we asked six members of the Swiss Public Sector Financial Reporting Advisory Committee to perform the criteria weighting procedure using the MACBETH multiple criteria decision analysis technique. We then coded each canton's accounting standards along the weighted criteria and eventually computed individual index scores.

The weighting procedure carried out with the help of the six experts clearly shows the relevance of using weighted criteria when assessing the convergence of cantonal accounting standards with IPSAS. However, our results also indicate that under both reforms, the criteria most applied in line with IPSAS are not necessarily the ones considered to be the most important by the experts, and vice versa. Due to the important political dimension of managing public finances in Switzerland, our results illustrate a trend among the cantons to sometimes put more emphasis on a prudent accounting approach, even if this involves defining standards that somewhat reduce financial transparency.

The index scores computed using the weighted criteria also indicate that, in general, the accounting policies of the Swiss cantons all became more convergent with IPSAS after the second reform, although there still remain intercantonal disparities. However, the cantons' overall ranking in terms of convergence did not change much between the first and the second reform. The cantons that brought their accounting standards the closest to IPSAS under the second reform were already showing high scores under the first one, and vice versa.

Comparing the weighted results with scores computed with equally weighted (i.e. unweighted) criteria brought to light some disparities in the cantons' individual results, and sometimes significantly. However, this does not amend our general conclusions since cantonal rankings only slightly changed under this alternative calculation. The paper's main assumption is thus validated.

The criteria we identified to assess whether governmental accounting standards converge or deviate from the IPSAS benchmark are related to Switzerland's specific institutional context. Further empirical research, possibly in other federalist countries, should therefore be conducted in order to verify the consistency of this approach.

From a policy viewpoint, the methodology we provide may be helpful for monitoring, in a situation of national or local accounting standard reforms, the extent to which homegrown accounting standards have been brought closer or still diverge from IPSAS.

From a research perspective, the ability to measure convergence or divergence between governmental accounting standards and IPSAS is a necessary steppingstone to develop further research on the effect that financial reporting faithfulness has, for instance, on governmental financial performance and its financial situation. The use of a similar method may reduce inaccuracies in measurement. Moreover, having a reliable convergence index at one's disposal could help better identify what factors (e.g. cultural, economic, financial, political, institutional, environmental factors) drive the development of a government's accounting standards.

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Appendixes

**Appendix 1 – Year of introduction of HAM1 and HAM2 in each Swiss canton**

Canton		Year of introduction of HAM1	Year of introduction of HAM2
ZH	Zurich	1982	2009
BE	Bern	1989	2017
LU	Luzern	1988	2012
UR	Uri	1984	2012
SZ	Schwyz	1987	2016
OW	Obwalden	1986	2012
NW	Nidwalden	1980	2010
GL	Glarus	1984	2011
ZG	Zug	1979	2012
FR	Freiburg	1996	2011
SO	Solothurn	1982	2012
BS	Basel City	1999	2013
BL	Basel Land	1981	2010
SH	Schaffhausen	1990	2018
AR	Appenzell A.	1978	2014
AI	Appenzell I.	1979	2015
SG	St. Gallen	1997	2014
GR	Graubünden	1988	2013
AG	Aargau	1995	2014
TG	Thurgau	1987	2012
TI	Ticino	1986	2014
VD	Vaud	1992	2014
VS	Valais	1983	2018
NE	Neuchâtel	1981	2018
GE	Geneva	1985	2014
JU	Jura	1979	2012

Source: Own investigation and SRS (2019)

Appendix 2 – Coding for the different criteria

	Criteria	Scaling format	Coding
1	Use of accrual rather than cash basis accounting principles	Dummy	1 = Yes 0 = No
2	Additional depreciation charges (i.e. no political finessing)	Discrete	1 = Prohibited by law and not used 0,5 = Permitted by law and not used 0 = Permitted by law and used
3	Annual performance smoothing, e.g. using rainy-day funds (i.e. no political finesse)	Dummy	1 = No 0 = Yes
4	Pre-financing (i.e. no political finesse)	Discrete	1,00 = No, in all cases 0,66 = No, with exception 0,33 = Yes, with exception 0,00 = Yes, in all cases
5	Linear depreciation method, over useful life rather than degressive depreciation	Discrete	1,00 = Over useful life and straight-line (linear) method 0,75 = Over useful life and sometimes with straight-line method 0,50 = Over useful life with both straight-line and degressive method 0,00 = Not over useful life
6	Accrual recognition of tax revenues	Discrete	1,0 = Purely accrual 0,5 = Modified accrual 0,0 = Cash basis
7	Measurement of non-administrative assets at market value rather than at historical cost	Discrete	1,0 = Market value 0,5 = Market value and others 0,0 = Otherwise
8	Start of depreciation as soon as the asset is available for use	Dummy	1 = Availability for use 0 = Otherwise
9	Low threshold for the recognition of capital expenditures in the statement of financial position	Continuous	1 – (cantonal threshold / highest cantonal threshold)
10	Low threshold for accruals and deferrals of past or future revenues and charges	Continuous	1 – (cantonal threshold / highest cantonal threshold)
11	Separate recognition of capital expenditures from the obtained grants to finance them	Dummy	1 = Separate recognition (gross value) 0 = Net value
12	Use of financial indicators	Dummy	1 = Yes 0 = No
13	Separate recognition of plots of land from buildings erected on them	Discrete	1,0 = Yes 0,5 = Yes or no, with exception 0,0 = No
14	Measurement of administrative assets at market value rather than at historical cost	Discrete	1,0 = Market value 0,5 = Market value and others 0,0 = Otherwise
15	Presentation of a cash flow statement in accordance with IPSAS	Dummy Discrete	Under HAM1: 1,0 = Yes and 0,0 = No Under HAM2: 1,0 = when investing activities include yield-producing investments 0,5 = when financing activities include yield-producing investments 0,0 = otherwise

Appendix 3 – Evolution of cantonal index scores computed with unweighted assessment criteria between HAM1 and HAM2, as a percentage
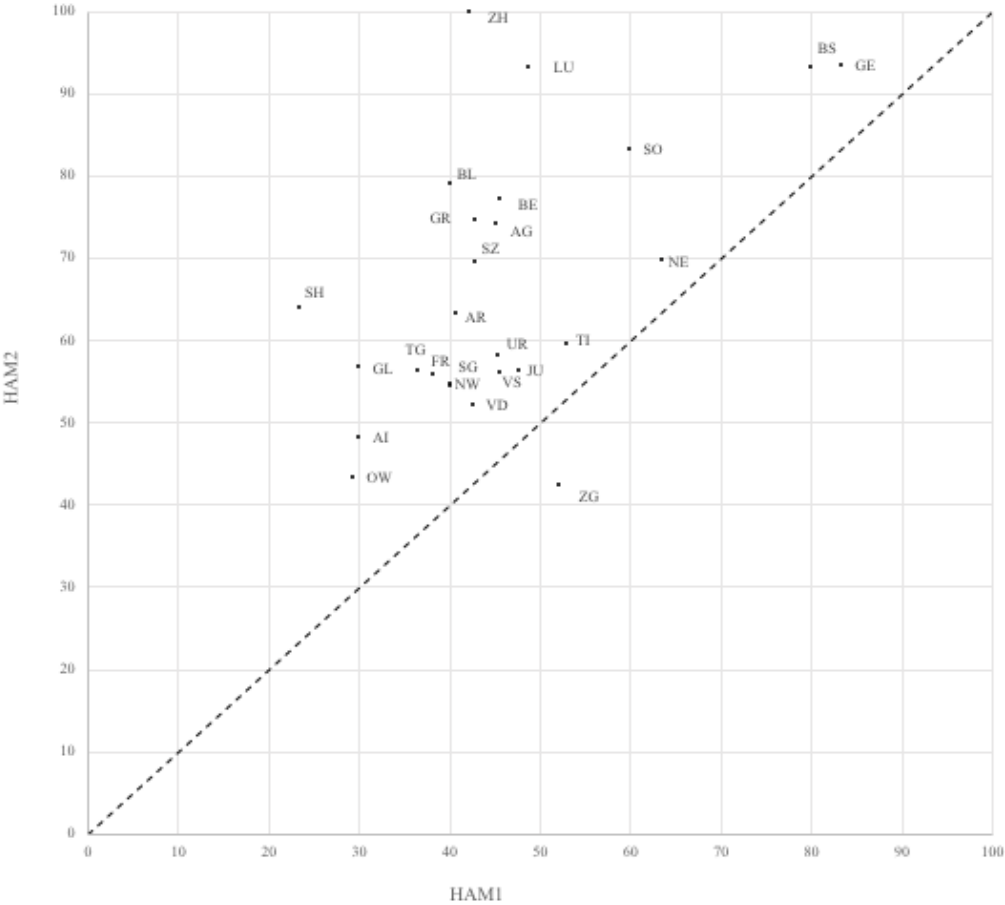
Appendix 4 – Distribution of the impact of using weighted or unweighted criteria, in percentage points
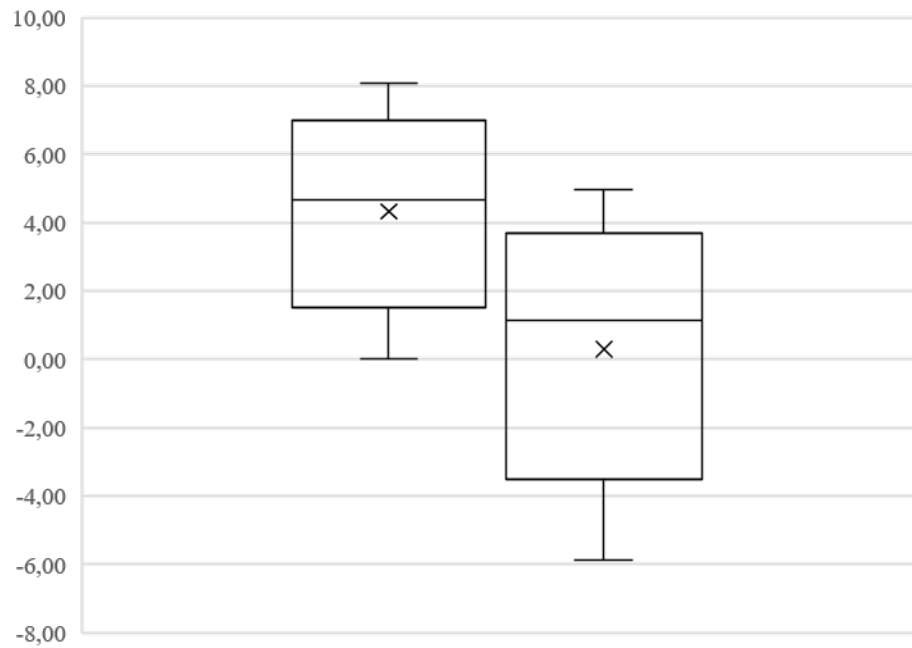
Note: The vertical axis shows the difference between scores computed with weighted or unweighted criteria, under HAM1 (left) and HAM2 (right) reforms. The plotted boxes show the limits of the first and third quartiles. The additional lines drawn along the second quartiles mark the medians. The minimums and maximums outside the first and third quartiles are depicted with T-lines (whiskers). The crosses show the means.

Appendix 5 – Paired sample t-test on index scores computed with weighted or unweighted assessment criteria under HAM1 and HAM2

	HAM1		HAM2	
	Weighted criteria	Unweighted criteria	Weighted criteria	Unweighted criteria
Mean	50,27769	45,69615	67,13654	66,46692
Std. Err.	2,800458	2,710665	3,263958	3,175601
Std. Dev.	14,27959	13,82173	16,64299	16,19245
t	-11,9096		1,2410	
Prob > |t|	0,000001		0,226100	

Note: The level of significance is 5% (two-tailed tests).

H0: The mean difference between index scores computed with weighted or unweighted assessment criteria is equal to zero.

Appendix 6 – Spearman rank correlation coefficients for index scores computed with weighted or unweighted assessment criteria under HAM1 and HAM2

	HAM1	HAM2
Sum of the squared differences in scores	140	126
n	26	26
Df	24	24
Rho coefficient	0,9521	0,9567
t	15,2570	16,1107
Prob > |t|	0,000001	0,000001

Note: The level of significance is 5% (two-tailed tests).

    H0: Cantonal ranking arising from scores computed with weighted or unweighted assessment criteria are independent.