The usefulness of accrual-based surpluses in the Canadian public sector

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Abstract

This paper investigates how useful accrual-based surpluses are when predicting future cash flows and surpluses in the context of the Canadian public sector. We provide evidence that surpluses incrementally enhance the ability of operating cash flows to predict future cash flows and surpluses. Analysis of our accrual quality model illustrates that in the public sector, accruals accounting is useful in mitigating the noise in operating cash flows. We also find that decomposing surpluses into operating cash flows and accruals enhances the ability of surpluses to forecast future cash flows and surpluses. Therefore, we conclude that aggregate and disaggregated surpluses are positively related to both relevance and reliability. We also find a lack of test results to support the presence of conservatism in the Canadian public sector, and confirm that the usefulness of surpluses in making predictions is independent of selected control factors.

Key Words: Surpluses, Cash flows, Accruals, Conservatism, Relevance, Reliability, Public sector, Canada.

JEL Classification: G28, H11, M41

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1. Introduction

In this paper, we examine the usefulness of accrual-based surpluses in the Canadian public sector. Over the past decades, many governments, including Canada's, have been undertaken significant reforms of their accounting systems through moving from cash to accrual accounting (Moretti, 2016). This change has come with significant discussion and scrutiny. Proponents of accrual accounting claim that its implementation is beneficial for assessing accountability and the financial performance of governmental organizations, and that it will increase reporting transparency. This presumes that the accrual financial statements provide information that is more understandable, less prone to managerial manipulation, and relevant to users' decision making (e.g., Plummer et al., 2007; Pridgen and Wilder, 2013). However, there is little evidence available to support these assertions. Furthermore, the concerns raised over such a transition cannot be ignored. One major concern regards the usefulness of applying business-based accrual financial reporting models to the public sector, given that sector's unique characteristics (such as taxation power, no open market for evaluating government goods and services, and non-transferable ownership, among others). Some reservations have also been voiced with regards to the cost of implementation and increased technical complexity (e.g., Christiaens & Rommel, 2008; Buhr, 2012; Adhikari & Gårseth-Nesbakk, 2016).

We contribute to this argument by investigating the role of accruals in enhancing surpluses' usefulness. In governmental financial reporting, a surplus/deficit (hereafter surplus) is the difference between revenues and expenses reported in a government's statement of operations. Like earnings in businesses, a surplus is considered the summary measure of government

operations and thus one of the key accounting items reported under accrual accounting. A focus on the usefulness of accrual-based surpluses is important because reporting surpluses is deemed relevant to the users of governmental accounting information in evaluating accountability and the government's operations. For example, in Canada, the Public Sector Accounting Board (PSAB) views a surplus as indicative of how the government's use of its net economic resources has been maintained over a period of time, which is useful for making decisions based on the ability of the government to employ those resource in the provision of future services (PSAB, 2011). Thus, any investigation into the usefulness of accrual-based surpluses is potentially relevant to those who prepare and use governmental financial statements, or regulate public sector financial reporting.

Our primary measures of surplus usefulness are relevance and reliability. Accounting standard setters agree on relevance and reliability as two fundamental qualitative characteristics of useful information for both public and private sectors.[1] Therefore, we build on the financial reporting quality research already published in the private sector context (e.g., Richardson et al., 2005; Kim & Kross, 2005; Bandyopadhyay et al., 2010), in which earnings relevance and reliability are linked to the ability of earnings to forecast future operating cash flows and earnings, respectively. Accordingly, we investigate two interrelated research questions. First, do accrual-based surpluses enhance the explanation of future operating cash flows? Second, do accrual-based surpluses enhance the explanation of future accrual-based surpluses?

We test our research questions in the Canadian public sector setting. The role of governments in Canada's economy is vital. Government expenditures totaled approximately 41% of the

[1] For example, see *Section PS 1000 Financial statement concepts and principles* (PSAB, 2003) and *Conceptual Framework* (International Financial Reporting Foundation, 2018).

Canadian Gross Domestic Product (International Monetary Fund, 2019)[2], and 20% of all employment nationwide took place in the public sector (Statistics Canada, 2011). Verifying the quality of government financial reporting is thus critical given the proportion of the economy it represents. Furthermore, unlike the US, Canada has employed cash flow reporting standards that enable us to use reported operating cash flows in our study. This is important since prior research (e.g. Austin & Bradbury, 1995; Hribar & Collins, 2002) finds that the value of operating cash flows, as estimated by balance sheet information, contains substantial errors and is thus a deficient proxy for reported operating cash flows. Canada has also developed a full separate set of public sector accounting standards. This differs from Australia, New Zealand and the UK, which controversially use a single set of accounting standards for both the private and public sectors (Buhr, 2012). Therefore, the Canadian setting reduces the possibility that the results of our study are affected by data measurement errors or a likely incompatible reporting regime. Furthermore, research on the quality of Canadian governmental accrual-based information is of particular importance and timely, given the PSAB project considering the adoption of the IPSASB standards (PSAB, 2018).

To address our research questions, we analyse a large sample of 2,490 government-year observations related to 350 provinces, territories, and local governments over the 2008–2017 period. We adopt the measures of relevance (predictive ability of surpluses to predict one-year ahead operating cash flows) and reliability (the ability of surpluses to predict one-year ahead surpluses) developed by Richardson et al. (2005) and Bandyopadhyay et al. (2010). Our study also goes a step further and directly explores the quality of accruals in two ways. First, we examine the

[2] In the US, UK, Australia and New Zealand, government expenditures to GDP are 35.14%, 38.77%, 36.71%, and 36.43%, respectively (International Monetary Fund, 2019).

relative importance that the cash flow and accrual components of surpluses hold to predicting future cash flows and surpluses, as per previous private sector studies (e.g., Barth et al., 2001). Second, we link accruals to operating cash flows using the Dechow and Dichev (2002) model. In this study, we also investigate the existence of conservatism through three different conservatism measures. Finally, we explicitly incorporate certain government characteristics (i.e., size, negative surpluses, negative operating cash flows, net debt-to total revenue ratio, and provincial groupings) that may be relevant to understanding the usefulness of public sector accrual data.

Overall, our results suggest that decision useful information is in fact provided by accrual accounting. More specifically, we provide evidence that accrual-based surpluses incrementally enhance the ability of operating cash flows to explain future operating cash flows and surpluses. We also find that the explanatory ability of surpluses for future cash flows and surpluses is enhanced by decomposing surpluses into operating cash flows and accruals. Therefore, we conclude that aggregate and disaggregated surpluses are positively related to both relevance and reliability. Analysis of the accrual quality model shows that public sector accruals accounting is useful in mitigating the noise in operating cash flows. Furthermore, our set of conservatism tests do not support a significant presence of conservatism in the Canadian public sector. We confirm that our main findings on the usefulness of surpluses are independent of selected control factors.

We make a single but important contribution to the governmental accounting literature. Our study is the first to consider both the relevance and reliability of accrual measures in a public sector setting. Our results provide support for the usefulness of public sector accrual data and contribute directly to the global debate on the benefits of accrual accounting measures to governmental financial reporting. Our study also relates to previous corporate-sector studies (e.g., Dechow 1994; Dechow et al. 1998; Dechow and Dichev, 2002, Barth et al., 2001) that examine the informative

value of earnings and its components relative to cash flows. We expand on this literature by focusing on a less known, distinct governmental setting rather than on a conventional corporate setting. We also provide useful information for the PSAB as it weighs the costs and benefits of transitioning to IPSAS. Our findings imply that accrual-based surpluses under PSAB standards are both relevant and reliable, such that the benefits of transition are likely less significant.

The remainder of the paper is organized into these sections. Section 2 reviews accrual accounting in the Canadian public sector and prior studies. Section 3 describes the research design, while Section 4 describes the sample selection procedure and reports descriptive statistics. Section 5 discusses the main results and Section 6 provides results from various sensitivity analyses. Section 7 concludes the paper with a brief summary and discussion.

2. Setting and literature review

2.1 Public sector accrual accounting in Canada

Canada's federal system of government is structured into three levels: federal, provincial/territorial, and municipal. The first two levels are called senior governments. In 1962, the Royal Commission on Government Organization recognized the need for significant changes in governmental accounting systems and a shift from cash to accrual accounting in the Canadian public sector (Baker and Rennie, 2006; Canadian Institute of Chartered Accountants, 1980). Despite this call, senior and local governments still employed their own non-accrual basis accounting and reporting practices up until the 1980s, and no generally accepted accounting principles and standards for governments existed. This resulted in wide variance across Canada in types of accounting information reported, reporting formats, and accounting methods used by different governments (Lin, 1993; Lin et al., 1993).

To address these issues, the Canadian Institute of Chartered Accountants (CICA) initiated a research study to investigate existing public sector accounting and reporting practices in 1980. In addition to identifying various reporting problems, the study recommended the establishment of generally accepted accounting standards for senior governments in Canada. The same was also suggested for local governments later, in a research study conducted by the Canadian Certified General Accountants (CCGA). Accordingly, a new standard-setting committee, the Public Sector Accounting and Auditing Committee (PSAAC) was established by the CICA. The PSAAC aimed to issue recommendation statements in order to improve and standardize accounting and auditing practices for both senior and local governments in Canada. However, no recommendation on accrual accounting was issued by the Committee (Lin, 1993; Lin et al., 1993, Buhr, 2012). In 1993, the PSAAC was restructured to the Public Sector Accounting and Auditing Board (PSAAB) in order to focus only on the approval of principles and policies, rather than on the development of new standards (CA magazine, 1993). Later in 1998, the PSAAB delegated its two main roles in auditing and accounting on two separate boards: the Audit and Assurance Board and the Public Sector Accounting Board (PSAB), respectively (Buhr, 2012).

Eventually, in 2005, the PSAB presented a new accounting model for senior governments that notably changed previous accounting practices. Accordingly, a full accrual accounting basis substituted the old expenditure basis of accounting. One significant change was the capitalization and depreciation of government tangible assets. However, sections on local government accounting and all references to senior and territorial governments were removed by amendment in February, 2007 (Herauf & Hilton, 2016). The PSAB is currently working on an important project relating to the adoption of the IPSAS (PSAB, 2018).

Overall, the PSAB has played an important standard-setting role in the adoption of public sector accrual accounting in Canada over the long term. Nevertheless, similar to other Anglo-American countries (Australia, New Zealand, the United Kingdom and the United States) the reform has also been motivated by New Public Management practices with the aim of producing a public sector that, like the business world, focuses on performance and results (e.g., Cohen & Karatzimas, 2017). Furthermore, the move to accrual accounting in Canada was much slower than in other Anglo-American countries. This, in turn, enabled the PSAB to develop a full separate set of public sector GAAP (Buhr, 2012). However, whether or not the PSAB accrual model has resulted in information that improves the usefulness of governmental financial reporting in Canada has not yet been explored. Our study examines this important and timely empirical question. The answer to this question can particularly be useful to the debate on IPSAS adoption.

2.2 Prior studies

There is scarce empirical evidence on the usefulness of public sector accrual-based information. Plummer et al. (2007)'s study is the first to empirically investigate the information relevance of U.S. accrual-based financial statements provided by Governmental Accounting Standards Board (GASB) Statement No. 34's reporting model for state and local governments.[3] They employ the association of financial information and default risk (as measured by underlying debt rating) as a proxy for relevance. Using a sample of 530 Texas school districts for fiscal year 2002, they found that the modified accrual earnings measure, as reported in the governmental fund

[3] Under GASB Statement No.34 reporting model, U.S. state and local governments are required to report both government-wide and fund financial statements. Government-wide financial statements include the statement of net position and statement of activities and should be prepared using the accrual basis of accounting. Fund financial statements should be reported on basis of the modified accrual accounting (GASB, 1999).

financial statements, is more informative in assessing default risk than accrual-based earnings measures, as reported in the statement of activities.

Pridgen and Wilder (2013), Benson and Marks (2014), and Reck and Wilson (2014) expand upon Plummer et al. (2007) by using different types of financial performance measures in their analyses, different kinds of US governments (e.g., cities, municipalities), different measures of default risk (e.g., bond interest costs, bond insurance premiums), and different sample periods. Overall, those authors have suggested that governmental accrual-based financial performance measures are useful in the assessment of default risk. An advantage our study enjoys over U.S. studies is that Canadian governments have been reporting statements of cash flows since 2005.[4] However, under the GASB financial reporting model, U.S. governments are not required to report statements of cash flows at the government-wide level (GASB, 1999). This provides us with an opportunity to directly examine the relevance of accrual surpluses in explaining future operating cash flows as reported in the statement of cash flows, rather than assessing default risk as a surrogate of future cash flows.[5] Applying reported rather than estimated operating cash flows is significant, as previous studies suggest that significant errors and bias emerge from the use of estimated operating cash flows (e.g. Austin & Bradbury, 1995; Hribar & Collins, 2002).

Pinnuk and Potter (2009) is the only study that focuses on the relevance of accrual-based accounting information in explaining local government future cash flows. In particular, they investigate (i) whether the accrual-based earnings of local governments are useful in explaining one-year ahead cash flows, and (ii) whether the earnings of local governments are conservative.

[4] While compliance with PSAB standards is not mandatory for Canadian governments, based on our survey, a majority of governments in Canada have been preparing their financial statements in line with PSAB standards since 2008.
[5] Default risk refers to the potential that an entity fails to generate enough cash in repaying their debt obligations (e.g., Reck and Wilson, 2014 among others). It is thus an indirect estimate of an entity's ability to generate cash flows.

Their sample includes 2,058 Australian local government-years from 1996-2003. Using various regression models similar to those used in the earnings quality research on corporate firms, they conclude that the earnings of local governments are useful in explaining one-year ahead cash flows. However, they did not find evidence to support the existence of conservatism in the financial reporting of Australian local governments.

We extend emerging literature on the quality of accrual-based information in the public sector in two important ways. First, while prior studies emphasize only the relevance of accrual-based accounting information from governments, we comprehensively investigate the usefulness of surpluses by focusing on their relevance and reliability. In particular, we examine (i) the usefulness of accrual-based surpluses, beyond that of operating cash flows, in explaining future cash flows and future surpluses; and (ii) the role of the accrual and cash flow components of surpluses in improving the usefulness of aggregate surpluses when explaining future cash flows and surpluses.

Second, our study focuses on the Canadian public sector context. Pinnuk and Potter's (2009) findings on the relevance of surpluses to explaining future cash flows in an Australian context may not be generalizable to the Canadian context, due to differences in financial reporting models between these two governments. For example, while the PSAB has developed a specific set of accounting standards for the Canadian governmental organizations, the Australian Accounting Standards Board (AASB) has taken a "sector-neutral" approach. Such an approach implies an overall comparability between the accounting standards of Australian governments and of businesses; from that premise, it follows that calculations of 'earnings' as reported in the 'income statements' of local governments are practically and conceptually similar to their equivalents reported in the income statement of businesses (e.g., Buhr, 2012; Pinnuk and Potter, 2009). Our focus on the Canadian context is important, as it allows us to investigate without that premise.

There is also substantial empirical evidence for the usefulness of accrual based information in explaining future cash flows and stock returns, as a surrogate of future cash flows (e.g., Dechow, 1994; Dechow et al., 1998; Barth et al., 2001; Kim and Kross, 2005 among others), as well as in predicting future earnings (e.g., Richardson et al., 2005; Bandyopadhyay et al., 2010) by business entities. Our study complements the financial reporting quality literature by examining the usefulness of surpluses and accruals in a public sector setting whose operating environment and accounting standards differ significantly from those of a business sector setting.

3. Research Design

3.1. The usefulness of surpluses

Relevance and reliability are the primary means by which we measure the usefulness of surpluses. As per previous studies in the corporate context (e.g., Barth et al., 2001; Richardson et al., 2005; Kim & Kross, 2005; Bandyopadhyay et al., 2010), we link the relevance and reliability of surpluses to the ability of current surpluses to explain future cash flow and future surpluses, respectively. In particular, we follow Bandyopadhyay et al. (2010) in the selection of regression models. Accordingly, this study expects that accrual-based surpluses capture additional information content about future operating cash flows and surpluses in the Canadian public sector beyond what operating cash flows would.

We first assess the relevance of surpluses by proxy, asking whether accrual-based surpluses improve the explanation of future cash flows. The following linear regression models are employed:

$$\text{Model}\,(1): CF_{it+1} = \alpha_0 + \alpha_1 CF_{it} + \varepsilon_{it}$$

$$\text{Model}\,(2): CF_{it+1} = \beta_0 + \beta_1 CF_{it} + \beta_2 SURP_{it} + \varepsilon_{it}$$

where *i* and *t* denote firm and year, *CF* the net operating cash flows reported in the statement of cash flows, and *SURP* the surpluses/deficits reported in a government's statement of operations. All variables are scaled by total assets at year-end. We predict the coefficients α_1, β_1 and β_2 are positive, in line with Bandyopadhyay et al. (2010), Kim and Kross (2005), and others.

To test our second research question, we investigate whether accrual-based surpluses enhance the explanatory power of operating cash flows for future surpluses. Models (3) and (4) are constructed as follows:

$$\text{Model}\,(3): SURP_{it+1} = \delta_0 + \delta_1 CF_{it} + \varepsilon_{it}$$

$$\text{Model}\,(4): SURP_{it+1} = \varphi_0 + \varphi_1 CF_{it} + \varphi_2 SURP_{it} + \varepsilon_{it}$$

The definitions of the variables are as in Models (1) and (2). All variables are scaled by total assets at year-end. Similarly, to Bandyopadhyay et al. (2010), we expect the coefficient on *CF* in Model (3) as well as the coefficients on *CF* and *SURP* in Model (4) are positive.

3.2. The usefulness of accruals

To further investigate the usefulness of surpluses in the Canadian public sector, we directly measure the quality of the accrual components of surpluses in the Canadian public sector. The direct link between the quality of accruals and the usefulness of accrual-based earnings has been well investigated in the financial accounting research. This relation is theoretically supported by the argument that the cash flow component of earnings provides both relevant and reliable information, whereas the accrual component involves a tradeoff between relevance and reliability.

On one hand, accruals are deemed relevant to the predictive ability of earnings as they overcome the timing and matching problems in operating cash flows. On the other, accruals are less reliable than operating cash flows, subject as they are to estimation and arbitrary allocations (e.g., Sloan 1996; Richardson et al. 2005).

We follow Barth et al. (2001)'s model to test if the disaggregation of surpluses into cash flow and accrual components can improve the usefulness of surpluses. Barth et al.'s (2001) model and results indicate that aggregate earnings give equal weight to different accrual components, thus concealing the usefulness of their information to accounting users; by contrast, disaggregating earnings into cash flow and accrual components enhances the usefulness of earnings in explaining future cash flows. Given those findings, we run the following regression models:

$$\text{Model (5)}: CF_{it+1} = \theta_0 + \theta_1 SURP_{it} + \varepsilon_{it}$$

$$\text{Model (6)}: CF_{it+1} = \gamma_0 + \gamma_1 CF_{it} + \gamma_2 ACC_{it} + \varepsilon_{it}$$

$$\text{Model (7)}: SURP_{it+1} = \lambda_0 + \lambda_1 SURP_{it} + \varepsilon_{it}$$

$$\text{Model (8)}: SURP_{it+1} = \eta_0 + \eta_1 CF_{it} + \eta_2 ACC_{it} + \varepsilon_{it}$$

All variables have been defined in previous models, and are scaled by total assets at year-end. We predict that *SURP*, *CF* and *ACC* have a positive relationship with one-year-ahead *CF* and one-year-ahead *SURP*.

3.3. The estimation of regression models

We use generalized least squares (GLS) to estimate our regression models, so that our data set is considered an unbalanced panel. In a panel data model, the error terms on cross sectional observations may behave differently from the error terms on time-series observations (Kmenta 1990, p. 616). This specific error structure may result in the violation of OLS assumptions (e.g.,

homoscedasticity and no autocorrelation). Consequently, GLS in general is a more efficient and less biased estimation technique, compared to OLS (Fomby et al., 1984, p. 337; Monem, 2003).

We use the chi-squared test (hereafter, χ^2 test) of coefficient equality to evaluate whether current *CF* and *SURP* convey distinct information about future *CF* and future *SURP*. The signs and magnitudes of all of the estimated coefficients in the regression models are also considered. To test the explanatory power of the models, we evaluate the adjusted R^2 measures. The adjusted R^2 in this context determines the extent to which our proposed regression models can explain the total variation of future *CF* and *SURP*.

4. Data

4.1. Sample selection

We hand collected the data from the annual financial statements of Canadian provincial, territorial and local governments, posted on their websites over the period between 2008-2017. As 2008 was the year in which the PSAB full accrual accounting model was applied to all levels of Canadian governments including provincial, territorial and local governments, we began our sample period there.[6] The sample is not limited to any year-end date and includes local governments with a population of 15,000 or more. In the case that the number of sample local governments in a province is less than 10, financial information about those local governments with a population of less than 15,000 has been collected. We also excluded governments with less than three

[6] Before February 2007, the *PSA Handbook* included four sections applicable only to federal, provincial, and territorial governments, and two sections applicable only to local governments. In February 2007, the PSAB withdrew the local government sections along with all references to federal, provincial, and territorial governments (PSAB, 2009a; Herauf & Hilton, 2018).

consecutive years of data, and remove observations in the extreme upper and lower 1 percent of their related distributions for each variable. Based on these criteria, the sample consists of 2,490 government-year observations related to 337 provinces, territories, and local governments over the 2008–2017 period.

4.2. Descriptive statistics

Table 1 compares the number of local governments in our sample in each province or territory with the composition of local governments in Canada in terms of provinces and territories. This shows that our sample underrepresents Newfoundland and Labrador (which comprise 1.78% of our sample but 7.59% of governments in the Canadian public sector), Quebec (17.21% in our sample, 31.75% in the Canadian public sector) and Saskatchewan (3.56% in our sample, 21.89% in the Canadian public sector). The sample also overrepresents British Columbia (17.21% in our sample, 4.54% in Canadian public sector) and Ontario (35.61% in our sample, 12.43% in the Canadian public sector). However, the sample of local governments in other provinces and territories generally matches their proportion of the Canadian public sector.

TABLE 1 ABOUT HERE

Panel A of Table 2 reports sample characteristics based on total revenues, total assets, and populations of the sampled governments. The governments in our sample had a mean (median; standard deviation) total revenue of $1,609.201 ($73.342; $9,699.452), total assets of $3,175.261 ($316.599; $14,663.137), and population of 254,809 people (36,094; 1,090,203), respectively. Noticeably, the mean in each category is much smaller than the related standard deviation. This suggests substantial variation in government size within the sample. While our sample is not dominated by large governments, it does contain a small number of very large governments, as indicated by each measure reporting a larger mean than median.

Panel B, Table 2 reports descriptive statistics for the sample. The mean (median) value of 0.0594 (0.0567) for operating cash flow (*CF*) is larger than the mean (median) for surpluses (*SURP*), which is 0.0309 (0.0282). This is mainly due to the non-cash expenses, such as depreciation expenses, included in the variable. Furthermore, the standard deviation of *CF* is 0.0395, higher than that of *SURP* (0.0349). This implies that the accrual process is able to mitigate a substantial portion of *CF* fluctuations. The mean (-0.0284) and median (-0.0289) for *ACC* are negative because *ACC* is calculated as *SURP* minus *CF* and the values of *SURP* are generally lower than those of *CF*.

Panel C of Table 2 presents the Pearson correlation coefficients among the accounting variables. The correlations of *SURP* with *CF* (r = 0.6599) and *ACC* (r = 0.2854) are positive and significant at the 0.01 level. *CF* has a negative correlation with *ACC* (r = -0.5317). The descriptive statistics for our sample are consistent overall with previous studies in the private sector (e.g., Barth et al., 2001; Richardson et al., 2005).

TABLE 2 ABOUT HERE

5. Empirical results

5.1. The usefulness of accrual-based surplus information

Table 3 provides primary empirical evidence to answer our two research questions. Panel A of Table 3 reports the summarized test results for the relative importance of surpluses in explaining future cash flows. The tests involve regressing one-year-ahead *CF* on current *CF* (Model (1)); and on current *CF* and *SURP* (Model (2)). The coefficient on *CF* (0.4514) in Model (1) is positive and significant (*t*-statistic = 11.0696) at the 0.01 level. In Model (2), the coefficients for *CF* (0.4086) and *SURP* (0.0945) are positive as predicted, and significant (*t*-statistic = 8.3408 and 3.8033,

respectively) at the 0.01 level. The null hypotheses, that the coefficients of *CF* and *SURP* are equal and that both are equal to zero, are rejected at the 0.01 level (χ^2 statistic = 40.6645 and 328.3550, respectively). Furthermore, the adjusted R^2 for Model (1) is 30.81 percent, less than that of Model (2) (35 percent). Combined, these results suggest that *SURP* has incremental information content over *CF* and that *CF* and *SURP* together provide significantly greater explanation for the variation in CF_{t+1} than does *CF* alone.

The results of estimating Model (3) and Model (4) are reported in the Panel B of Table 2. The models regress one-year-ahead *SURP* on current *CF* (Model (3)), and on current *CF* and *SURP* (Model (4)). The coefficient on *CF* in Model (4) is positive and highly significant (δ_1 = 0.2625, *t*-statistic = 13.8164), with the adjusted R^2 value of 14.27 percent. Coefficients on *CF* (0.0612) and *SURP* (0.4248) in Model (4) are positive, as per our prediction, and significant at the 0.01 level (*t*-statistic = 2.8471 and *t*-statistic = 15.3568, respectively). The adjusted R^2 of Model (4) is 32.24 percent, clearly higher than that of Model (3). The results provide evidence that *SURP* has incremental information content over, and more persistent than, *CF* in explaining future *SURP*.

TABLE 3 ABOUT HERE

5.2. The usefulness of Accruals

In Table 4, we provide some evidence on the role of accruals (*ACC*) in the usefulness of *SURP* when explaining future *CF* and future *SURP*. Panel A of Table 4 report the results of Models (5) and (6). Model (5) concerns the usefulness of *SURP* in the explanation of future cash flows. Model (6) relates to the relative relevance of the cash flow and accrual components of *SURP* in explaining future *CF*. In Model (5), the coefficient on current *SURP* (0.3373) is positive, as predicted, and significant at the 0.01 level (*t*-statistic = 24.1308). Coefficients on *CF* (0.5072) and *ACC* (0.0641) in Model (6) are positively significant at the 0.01 level (*t*-statistic = 17.1122 and *t*-

statistic = 2.7640, respectively). The χ^2 statistic measures indicate that the *CF* and *ACC* coefficients are statistically and significantly not equal, and that both differ from zero (χ^2 statistic = 145.7548 and 296.4890, respectively). Thus, the results provide evidence that *ACC* has incremental information content over *CF*. *CF* is also more persistent than *ACC* in explaining future cash flows. Comparison of the adjusted R^2 values between Model (5) (18.73 percent) and Model (6) (41.48 percent) reveals that disaggregating *SURP* into *CF* and *ACC* results in significantly higher explanatory power for future cash flows than does using aggregate *SURP*.

TABLE 4 ABOUT HERE

Table 4, Panel B reports the results of regressions of one-year-ahead *SURP* on aggregate *SURP* (Model (7)), and of disaggregated *SURP* into *CF* and *ACC* (Model (8)). The findings show that, as predicted, the association of current *SURP* and future *SURP* is positive and significant at the 0.01 level (λ_1 = 0.4732, *t*-statistic = 14.2560). Moreover, in Model (8), *CF* (0.4783) and *ACC* (0.4291) are positive and statistically significant at the 0.01 level (*t*-statistic = 25.4461 and *t*-statistic = 22.9112, respectively). The results of χ^2 statistic show that the coefficient on *CF* and *ACC* significantly differ from each other and from zero at the 0.01 level. In addition, Model (7), with an adjusted R^2 of 37.50%, has higher overall explanatory power than Model (8) (adjusted R^2 = 40.83%). These results show that Model (8) consistently outperforms Model (7). That is, the cash flow and accrual components of surpluses individually contribute to the explanation of future surpluses, while using aggregate surpluses alone masks their information content. A comparison of the difference in explanatory powers between Models (5) and (6), as well as Models (6) and (7), indicate that the disaggregation of surpluses into *CF* and *ACC* provides more useful information value in explaining future *CF* rather than does using future *SURP* alone.

6. Further analyses

6.1. Accruals quality

We adopt one of the primary accrual quality models developed by Dechow and Dichev (2002), to further test the usefulness of accruals, as follows:

$$\text{Model (9)}: ACC_{it} = \psi_0 + \psi_1 CF_{it} + \psi_2 CF_{it-1} + \psi_3 CF_{it+1} + \varepsilon_{it}$$

where *ACC* denotes total accruals, calculated as the difference between *SURP* and *CF*. The definitions of the other variables are as in Models (1) and (2). As per Dechow and Dichev (2002), we predict a negative relationship between *ACC* and current *CF* as well as a positive relationship between *ACC* and past and future *CF*. All variables are scaled by total assets at year-end.

Table 5 presents the results of Model (9). The slope coefficient for current *CF* is significantly negative at the 0.01 level (CF_{it} = -0.4649, *t*-statistic = -28.2840). However, coefficients for one-year lagged *CF* (CF_{it-1} = 0.0424, *t*-statistic = 2.4859) and one-year ahead *CF* (CF_{it+1} = 0.0886, *t*-statistic = 5.2712) are positively and significantly related to *ACC* at the 0.05 and 0.01 levels, respectively. All the variables carry the expected signs, as per Dechow and Dichev (2002).

The above analysis supports our main results on the usefulness of accruals in the Canadian public sectors. In particular, the negative relationship between *ACC* and current *CF* indicate that accrual information is useful in mitigating timing and matching problems in operating cash flows (see Dechow & Dichev, 2002, Dechow et al. 1998, among others).

TABLE 5 ABOUT HERE

6.2. Conservatism and the trade-off between relevance and reliability of surpluses

One of our main findings on the usefulness of accrual-based surpluses, as evidenced by the explanatory powers of the related models and the amount of the *SURP* coefficients, show that

surpluses provide more incremental information over and above operating cash flows in explaining future earnings rather than in explaining future surpluses. Thus, it can be concluded that surpluses are more reliable than relevant in the Canadian public sector. This is different from the findings of previous studies using publicly listed companies. In particular, Bandyopadhyay et al. (2010) show that the relevance of earnings increases while its reliability decreases, and attributed the result to an increasing level of accounting conservatism. Furthermore, Pinnuk and Potter (2009) report no evidence of accounting conservatism in the Australian local governments. This also is consistent with the findings of previous studies (e.g., Ball et al., 2000; Nikkinen & Sahlström, 2004) on the quality of financial reporting in common law countries and code law countries. For example, Ball et al. (2000)'s study shows a lower level of conservatism in code law countries, where capital markets are mostly influenced by governments, than in common law countries.

To test if the higher reliability of surpluses relative to their relevance is linked to a weak presence of conservatism in the Canadian public sector[7], we first estimate Model (10), as developed by Ball and Shivakumar (2006). Model (10) is a modified version of the Dechow and Dichev (2002) accrual model:

$$\text{Model (10)}: ACC_{it} = \psi_0 + \psi_1 CF_{it} + \psi_2 CF_{it-1} + \psi_3 CF_{it+1} + \psi_4 D\Delta CF_{it} + \psi_5 D\Delta CF_{it} * CF_{it} + \varepsilon_{it}$$

where $D\Delta CF_{it}$ is a dummy variable that is equal to 1 if ΔCF_{it} is negative and 0 otherwise. ΔCF_{it} is calculated as $\Delta CF_{it} = CF_{it} - CF_{it\text{-}1}$.

Ball and Shivakumar (2006, p. 210) describe conditional conservatism "as asymmetric gain and loss recognition timeliness". They hypothesize that, since the loss recognition of accruals is timely relative to that of gains, the link between cash flows and accruals is not symmetrical.

[7] We follow Pinnuk and Potter (2009) in choosing the set of our conservatism tests.

Accordingly, they incorporate proxies for the recognition of the current year gains and loss in the selected accrual models, including Dechow and Dichev (2002)'s model, to estimate conservatism. As per Ball and Shivakumar (2006), a significant and positive slope coefficient on $D\Delta CF_{it} * CF_{it}$ implies that conservatism exists. The reason is that the relation between cash flows and accruals is more likely to be positive in periods in which the change in *CF* is negative. The coefficient on current *CF* is expected to be negative and the ones on past and future *CF* is positive, as previously predicted. There is no predication on other independent variables.

We also adopt Ball and Shivakumar (2005)'s regression model to further investigate the existence of conservatism in the Canadian governments.

$$\text{Model}\,(11): \Delta SURP_{it} = \tau_0 + \tau_1 \Delta SURP_{it-1} + \tau_4 D\Delta SURP_{it-1} + \tau_5 D\Delta SURP_{it-1} * \Delta SURP_{it-1} + \varepsilon_{it}$$

where $\Delta SURP_{it}$ denotes the change in surpluses, which is calculated as $\Delta SURP_{it} = SURP_{it} - SURP_{it-1}$. $D\Delta SURP_{it}$ is a dummy variable equal to 1 if $\Delta SURP_{it}$ is negative and 0 otherwise.

Following Ball and Shivakumar (2005), we predict a significant and negative slope coefficient on $D\Delta SURP_{it} * \Delta SURP_{it-1}$ if there is a timely loss recognition relative to gains (i.e., conservatism) in Canadian government financial reporting. The coefficient on $\Delta SURP_{it-1}$ is predicted to be zero if gains are recognized as persistent component of surpluses. A negative $\Delta SURP_{it-1}$ coefficient $(\tau_1 < 0)$ implies that gains are recognized as transitory and thus tend to be reversed.

Table 6, Panel A and B reports the results of the estimation of Models (10) and (11), respectively. Our findings show that, in Model (10), the coefficient on $D\Delta CF_{it}$ is statistically insignificant. Furthermore, the coefficient on $D\Delta CF_{it} * CF_{it}$ (-0.1912) is significant at the 0.01 level but holds a negative sign, contrary to expectations. Other variables are significant with the

predicted sign. The results of Model (11) indicates that the coefficients for both $D\Delta SURP_{it\text{-}1}$ and $D\Delta SURP_{it\text{-}1}*\Delta SURP_{it\text{-}1}$ are not significant at any statistical levels.

TABLE 6 ABOUT HERE

As a robustness check for the existence of conservatism, we evaluate the skewness of surpluses. Previous corporate sector studies (e.g., Basu, 1997; Givoly & Hayn, 2000) show that if conservatism exists, the distribution of earnings should be negatively skewed and that of operating cash flows should be positively skewed. The measures of *SURP* and *CF* skewness, as reported in Panel B of Table 2, are 2.2033 and 3.8188, respectively. A positive skewness of surpluses can be considered an absence of conservatism in the Canadian public sector. Taken together, we conclude that the existence of conservatism in the Canadian public sector is not significant or perceptible. This conclusion supports Pinnuk and Potter (2009)'s finding on the absence of conservatism in the Australian public sector using the same conservatism measures.

6.3. Government-specific characteristics

We perform Models (2.1) and (2.4) to check if our results from the analysis of Models (2) and (4) on the usefulness of surpluses are conditional on the size of a government, the sign of surpluses, the sign of operating cash flows, and the net debt-to-total revenues ratio. Prior literature in the corporate sector documents that the relative usefulness of accrual- and cash-based information may be different based on some firm-specific characteristics, such as size, profitability and the sign of operating cash flows (e.g., Farshadfar & Monem, 2013, Farshadfar & Monem, 2019, among others). In addition, the debt-to-total revenue ratio is a government specific indicator introduced by PSAB (2009b) in *Statement of Recommended Practice* (*SORP*) No. 4. The ratio is

categorized as a sustainability indicator since an increase in the ratio may indicate a diminishing ability of the government to eliminate net debt.[8, 9] Models (2) and (4) are modified as follows:

$$\text{Model (2.1)}: CF_{it+1} = \beta_0 + \beta_1 CF_{it} + \beta_2 SURP_{it} + \beta_3 CONTROL_{it} + \beta_4 CONTROL * SURP_{it} + \varepsilon_{it}$$

$$\text{Model (4.1)}: SURP_{it+1} = \varphi_0 + \varphi_1 CF_{it} + \varphi_2 SURP_{it} + \varphi_3 CONTROL + \varphi_4 CONTROL * SURP_{it} + \varepsilon_{it}$$

where *CONTROL* refers to the following dummy variables: *SIZE* is equal 1 if the population of a government is more than the median, and 0 otherwise; *NEG SURP* is equal 1 if *SURP* < 0, and 0 otherwise; *NEG CF* is equal 1 if *CF* < 0, and 0 otherwise; *NET DEBT* is equal 1 if the ratio of net debt-to-total annual revenue is more than the median, and 0 otherwise.

TABLE 7 ABOUT HERE

Table 7 reports the results of the estimation of the Models (2.1) and (4.1) by each control variable. Our main findings on the usefulness of surpluses are unaffected by size[10], the sign of surpluses, operating cash flows, or net debt-to-total annual revenue ratio. This is evidenced by the positive and significant *SURP* coefficient, as well as by the lower explanatory power of the modified models relative to the original ones across all control factors. However, two points need to be noted. First, the coefficients on *SIZE*SURP* and *NEG CF*SURP* in Models (2.1) and (4.2) are positively and statistically significant. This may provide some support that the usefulness of accrual-based information in the Canadian public sector increases with size. Furthermore, negative operating cash flows are likely to be more transitory. Thus, the accrual component of surpluses may play a more important role in reducing noise when a government reports negative operating

[8] Net debt is calculated as the difference between financial assets and liabilities. The purpose of this important measure is to evaluate the extent to which a government needs to generate revenues to pay for past spending (PSAB, 2009b).
[9] Sustainability, in addition to flexibility and vulnerability, is an important element that needs be considered to gauge a government's financial condition. *SORP-4*, para. 23 refers to sustainability as "a government's ability to manage its financial and service commitments and debt burden" (PSAB, 2009b).
[10] In unreported tests, we use total assets and total revenues as proxy for size. Our findings are qualitatively the same.

cash flows. The second point is that, in Model (4.2), the coefficient on *NET DEBT*SURP* is negative and statically significant at the 0.05 level.[11] This shows that the surpluses are more persistent and thus useful in governments with a lower level of net debt.

6.4. The usefulness of surpluses by provinces

In this section, we examine if the informational role of surpluses varies across provinces and local governments in a province. The reason for this analysis is because the financial conditions of local governments and their compliance with PSAB reporting standards are likely to be province-specific (e.g., Herauf and Hilton, 2018). To be included in our analysis, each province needs to represent at least 10 local governments in our sample. To test the effect of the governmental environment on the usefulness of surpluses, we run Models (2.2) and (4.2) as follows:

$$\text{Model (2.2)}: CF_{it+1} = \beta_0 + \beta_1 CF_{it} + \beta_2 SURP_{it} + \beta_3 PROVINCE_{it} + \beta_4 PROVINCE * SURP_{it} + \varepsilon_{it}$$

$$\text{Model (4.2)}: SURP_{it+1} = \varphi_0 + \varphi_1 CF_{it} + \varphi_2 SURP_{it} + \varphi_3 PROVINCE + \varphi_4 PROVINCE * SURP_{it} + \varepsilon_{it}$$

where *PROVINCE* refers to the following dummy variables: *AB* is equal to 1 if the local governments are located in the province of Alberta, and 0 otherwise; *BC* is equal to 1 if the local governments are located in the province of British Columbia, and 0 otherwise; *MB* is equal to 1 if the local governments are located in the province of Manitoba, and 0 otherwise; *NB* is equal to 1 if the local governments are located in the province of New Brunswick, and 0 otherwise; *NS* is equal to 1 if the local governments are located in the province of Nova Scotia, and 0 otherwise; *ON* is equal to 1 if the local governments are located in the province of Ontario, and 0 otherwise; *QC* is equal to 1 if the local governments are located in the province of Quebec, and 0 otherwise;

[11] Our main results are unaffected when another sustainability measure, the assets-to-liabilities ratio, is employed as a control factor (unreported).

and *SK* is equal to 1 if the local governments are located in the province of Saskatchewan, and 0 otherwise.

TABLE 8 ABOUT HERE

As reported in Table 8, the coefficients on *SURP* and *CF* are positive and significantly different from zero at the 0.01 statistical level in Models (2.2) and (2.4) across all selected provinces and their local governments. Furthermore, it appears that only the slope coefficients on *NB*SURP* and *BC*SURP* in Models (2.2) and (2.4) are positive and significant at the 0.01 levels. Thus, β_4 is insignificant across other provincial groupings. These results imply that the usefulness of surpluses is not impacted by province. However, the provinces of British Columbia and New Brunswick and their local governments may report more relevant and reliable surpluses overall.[12]

7. Conclusions

In this study, we focus on the usefulness of accrual-based surpluses in the Canadian public sector. Our motivation stems from the lack of research on this important issue in a public sector setting, and by our access to the accrual-based financial data provided by Canadian governments since 2008. As per the PSAB conceptual framework, the usefulness of surpluses is measured by the degree to which they are relevant and reliable (PSAB, 2003). In the corporate sector, empirical studies (e.g., Richardson et al., 2005; Kim & Kross, 2005; Bandyopadhyay et al. 2010), the ability of earnings to predict future cash flows and future earnings are considered as the relevance and reliability of earnings, respectively. Thus, we examine two important research questions: First, do

[12] In an unreported test, we remove data relating to provinces and focus on data from local governments. Our inferences remain unchanged.

accrual-based surpluses improve the explanation of future operating cash flows? Second, do accrual-based surpluses improve the explanation of future accrual-based surpluses?

Based on a unique sample of hand collected data from 337 Canadian governments over the period of 2008 – 2017 (2,490 government-year observations), we find that accrual-based surpluses capture incremental information about future operating cash flows and future surpluses over and above the information operating cash flows provide. However, the reliability of surpluses (i.e., their ability to explain future surpluses) is relatively higher than their relevance (i.e., their ability to explain future cash flows). This result remains robust even after the manipulation of various control factors, including government size, the sign of surpluses, the sign of operating cash flows, the ratio of net debt to total revenues, the ratio of total assets to total liabilities, and any grouping of local governments by provinces. Moreover, the disaggregation of surpluses into operating cash flows and accruals further enhances the ability of surpluses to explain future cash flows and surpluses. Additional analysis on the quality of accruals indicates that the accrual component of surpluses is useful in mitigating the noise in operating cash flows. Also, results from our conservatism tests confirm that the relatively higher reliability and lower relevance of surpluses can be attributed to a relative absence of conservatism in the Canadian public sector setting.

We provide the first comprehensive empirical evidence for the usefulness of aggregated and disaggregated accrual-based surpluses to explaining both future cash flows and future surpluses in a public sector setting. This study has important implications for the global debate on the usefulness of public sector accrual-based financial reporting, and for the PSAB as it considers the adoption of IPSASB standards. Our findings unambiguously highlight that aggregate and disaggregated surpluses are both relevant and reliable in the Canadian public sector.

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Table 1

Sample composition by provinces and territories

Provinces/Territories	Number of local governments	Sample local government composition by provinces and territories	Local government composition by provinces and territories
Alberta	39	11.57%	9.91%
British Columbia	58	17.21%	4.54%
Manitoba	11	3.26%	3.84%
New Brunswick	13	3.86%	2.99%
Newfoundland and Labrador	6	1.78%	7.59%
Nova Scotia	10	2.97%	1.40%
Ontario	120	35.61%	12.43%
Prince Edward Island	3	0.89%	2.07%
Quebec	58	17.21%	31.75%
Saskatchewan	12	3.56%	21.89%
Northwest Territories	3	0.89%	0.67%
Nunavut	1	0.30%	0.70%
Yukon	3	0.89%	0.22%
Total Sample	337	100.00%	100.00%

Canada has ten provinces and three territories. The provinces, in alphabetical order, are as follows: Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island, Quebec, and Saskatchewan. The three territories are the Northwest Territories, Nunavut, and Yukon. Local government composition is estimated based on the number of the listed local governments Canada in 2016 by provinces and territories. The data is extracted from the Statistics Canada website (Statistics Canada, 2017). The sample composition by provinces and territories is based on the initial sample, containing 337 local governments.

Table 2
Summary statistics and correlation matrix (2,490 government-years, 2008-2017)

Panel A: Sample descriptive statistics by total assets, total revenues and population

Variable	Mean	Lower Quartile	Median	Upper Quartile	Std. Dev.
Total Revenues (Canadian $ million)	1,609.201	34.103	73.342	198.497	9,699.452
Total assets (Canadian $ million)	3,175.261	144.137	316.599	594.150	14,663.137
Population	254,809	19,771	36,094	97,496	1,090,203

Panel B: Sample descriptive statistics for model variables

Variable	Mean	Lower Quartile	Median	Upper Quartile	Std. Dev.	Skewness
CF	0.0594	0.0403	0.0567	0.0740	0.0395	3.8188
SURP	0.0309	0.0131	0.0282	0.0454	0.0349	2.2033
ACC	-0.0284	-0.0429	-0.0289	-0.0124	0.0310	0.6121

Panel C: Pearson correlation matrix

	CF	*SURP*	*ACC*
CF	1.0000		
SURP	0.6599***	1.0000	
ACC	-0.5317***	0.2854***	1.0000

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *SURP* is annual surplus or deficit, as reported in the statement of operations. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. All variables are scaled by total assets at year-end. *** Indicates statistical significance at the 0.01 level.

Table 3
The usefulness of surpluses in explaining future operating cash flows and future surpluses

Panel A: Regressions of one-year ahead operating cash flows on current operating cash flows and surpluses

$$\text{Model (1)}: CF_{it+1} = \alpha_0 + \alpha_1 CF_{it} + \varepsilon_{it}$$
$$\text{Model (2)}: CF_{it+1} = \beta_0 + \beta_1 CF_{it} + \beta_2 SURP_{it} + \varepsilon_{it}$$

	Relevance			
	Model (1)		Model (2)	
Variable	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Intercept	0.0322	14.6066***	0.0311	12.5174***
CF	0.4514	11.0696***	0.4086	8.3408***
SURP			0.0945	3.8033***
Adjusted R^2	30.81%		35.00%	
Tests of coefficient restrictions:				
Null hypothesis			χ^2 statistic	*p*-value
$\beta_1 = \beta_2 = 0$			328.3550	0.0000
$\beta_1 = \beta_2$			40.6645	0.0000
N	2,159		2,159	

Panel B: Regressions of one-year ahead surpluses on current operating cash flows and surpluses

$$\text{Model (3)}: SURP_{it+1} = \delta_0 + \delta_1 CF_{it} + \varepsilon_{it}$$
$$\text{Model (4)}: SURP_{it+1} = \varphi_0 + \varphi_1 CF_{it} + \varphi_2 SURP_{it} + \varepsilon_{it}$$

	Reliability			
	Model (3)		Model (4)	
Variable	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Intercept	0.0143	9.0075***	0.0131	7.5011***
CF	0.2625	13.8164***	0.0612	2.8471***
SURP			0.4248	15.3568***
Adjusted R^2	14.27%		32.24%	
Tests of coefficient restrictions:				
Null hypothesis			χ^2 statistic	*p*-value
$\varphi_1 = \varphi_2 = 0$			281.4482	0.0000
$\varphi_1 = \varphi_2$			87.2840	0.0000
N	2,164		2,164	

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *SURP* is annual surplus or deficit, as reported in the statement of operations. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. Models (1) – (4) are estimated using the generalized least squares technique. The *t*-statistic is based on White's (1980) robust standard errors. All variables are scaled by total assets at year-end. *** indicates statistical significance at the 0.01 level. *N* is the number of government-year observations.

Table 4
The usefulness of accruals in explaining future cash flows and future surpluses

Panel A: Regressions of one-year ahead operating cash flows on current operating cash flows and accruals

$$\text{Model (5)}: CF_{it+1} = \theta_0 + \theta_1 SURP_{it} + \varepsilon_{it}$$
$$\text{Model (6)}: CF_{it+1} = \gamma_0 + \gamma_1 CF_{it} + \gamma_2 ACC_{it} + \varepsilon_{it}$$

	Relevance			
	Model (5)		Model (6)	
Variable	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Intercept	0.0476	57.5429***	0.0299	12.5174***
SURP	0.3373	24.1308***		
CF			0.5072	17.1122***
ACC			0.0641	2.7640***
Adjusted R^2	18.73%		41.48%	
Tests of coefficient restrictions:				
Null hypothesis			χ^2 statistic	*p*-value
$\gamma_1 = \gamma_2 = 0$			296.4890	0.0000
$\gamma_1 = \gamma_2$			145.7548	0.0000
N	2,158		2,158	

Panel A: Regressions of one-year ahead surpluses on current operating cash flows and accruals

$$\text{Model (7)}: SURP_{it+1} = \lambda_0 + \lambda_1 SURP_{it} + \varepsilon_{it}$$
$$\text{Model (8)}: SURP_{it+1} = \eta_0 + \eta_1 CF_{it} + \eta_2 ACC_{it} + \varepsilon_{it}$$

	Reliability			
	Model (7)		Model (8)	
Variable	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Intercept	0.0154	23.0534***	0.0138	10.8432***
SURP	0.4732	14.2560***		
CF			0.4783	25.4461***
ACC			0.4291	22.9112***
Adjusted R^2	37.50%		40.83%	
Tests of coefficient restrictions:				
Null hypothesis			χ^2 statistic	*p*-value
$\eta_1=\eta_2=0$			798.0089	0.0000
$\eta_1=\eta_2$			6.5546	0.0105
N	2,170		2,164	

(Continued)

Table 4 (Continued)

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *SURP* is annual surplus or deficit, as reported in the statement of operations. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. Models (5) – (8) are estimated using the generalized least squares technique. The *t*-statistic is based on White's (1980) robust standard errors. All variables are scaled by total assets at year-end. *** indicates statistical significance at the 0.01 level. *N* is the number of government-year observations.

Table 5
Regression of accruals on past, present, and future operating cash flows

$$\text{Model (9)}: ACC_{it} = \psi_0 + \psi_1 CF_{it} + \psi_2 CF_{it-1} + \psi_3 CF_{it-1} + \varepsilon_{it}$$

	Model (9)	
Variable	Coefficient	*t*-statistic
Intercept	-0.0086	-23.8809***
CF_{it}	-0.4649	-28.2840***
CF_{it-1}	0.0424	2.4859**
CF_{it+1}	0.0886	5.2712***
Adjusted R^2	52.03%	
Tests of coefficient restrictions:		
Null hypothesis	χ^2 statistic	*p*-value
$\psi_1 = \psi_2 = \psi_3 = 0$	3155.8850	0.0000
$\psi_1 = \psi_2 = \psi_3$	574.3242	0.0000
N	1933	

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. Model (9) is calculated using the generalized least squares technique. The *t*-statistic is based on White's (1980) robust standard errors. All variables are scaled by total assets at year-end. **, *** indicate statistical significance at the 0.05 and 0.01 levels, respectively. *N* is the number of government-year observations.

Table 6
Tests of conservatism

Panel A: Regressions of one-year ahead operating cash flows on current operating cash flows and surpluses

$$\text{Model (10)}: ACC_{it} = \psi_0 + \psi_1 CF_{it} + \psi_2 CF_{it-1} + \psi_3 CF_{it+1} + \psi_4 D\Delta CF_{it} + \psi_5 D\Delta CF_{it} * CF_{it} + \varepsilon_{it}$$

	Model (10)	
Variable	Coefficient	*t*-statistic
Intercept	-0.0097	-3.7094***
CF_{it}	-0.2942	-5.6406***
$CF_{it\text{-}1}$	0.0652	4.2576***
CF_{it+1}	0.0797	4.4613***
$D\Delta CF_{it}$	0.0015	0.5684
$D\Delta CF_{it}$* CF_{it}	-0.1912	-3.5671***
Adjusted R^2	60.48%	
Tests of coefficient restrictions:		
Null hypothesis	χ^2 statistic	*p*-value
$\psi_1 = \psi_2 = \psi_3 = \psi_4 = \psi_5 = 0$	19,337.10	0.0000
$\psi_1 = \psi_2 = \psi_3 = \psi_4 = \psi_5$	2,094.301	0.0000
N	1933	

Panel B: Regressions of one-year ahead surpluses on current operating cash flows and surpluses

$$\text{Model (11)}: \Delta SURP_{it} = \tau_0 + \tau_1 \Delta SURP_{it-1} + \tau_2 D\Delta SURP_{it-1} + \tau_3 D\Delta SURP_{it-1} * \Delta SURP_{it-1} + \varepsilon_{it}$$

	Model (10)	
Variable	Coefficient	*t*-statistic
Intercept	0.0035	2.6346 ***
$\Delta SURP_{it\text{-}1}$	-0.3366	-4.3455***
$D\Delta SURP_{it\text{-}1}$	-0.0017	-1.6143
$D\Delta SURP_{it\text{-}1}$*$\Delta SURP_{it\text{-}1}$	0.1630	1.5871
Adjusted R^2	13.45 %	
Tests of coefficient restrictions:		
Null hypothesis	χ^2 statistic	*p*-value
$\tau_1 = \tau_2 = \tau_3 = 0$	126.2615	0.0000
$\tau_1 = \tau_2 = \tau_3$	124.3579	0.0000
N	1933	

(Continued)

Table 6 (continued)

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *SURP* is annual surplus or deficit, as reported in the statement of operations. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. Models (10) and (11) are estimated using the generalized least squares technique. The *t*-statistic is based on White's (1980) robust standard errors. All variables are scaled by total assets at year-end. *** indicates statistical significance at the 0.01 level. *N* is the number of government-year observations.

Table 7

The usefulness of surpluses in explaining future cash flows and future surpluses, controlling for negative and positive surpluses

$$\text{Model (2.1)}: CF_{it+1} = \beta_0 + \beta_1 CF_{it} + \beta_2 SURP_{it} + \beta_3 CONTROL_{it} + \beta_4 CONTROL * SURP_{it} + \varepsilon_{it}$$

$$\text{Model (4.1)}: SURP_{it+1} = \varphi_0 + \varphi_1 CF_{it} + \varphi_2 SURP_{it} + \varphi_3 CONTROL + \varphi_4 CONTROL * SURP_{it} + \varepsilon_{it}$$

Variable	Size		Negative surpluses		Negative cash flows		Net debt ratio	
	Model (2.1)	Model (4.1)	Model (2.1)	Model (4.1)	Model (2.1)	Model (4.1)	Model (2.1)	Model (4.1)
Intercept	0.036***	0.022***	0.031***	0.014***	0.029***	0.013***	0.031***	0.013***
CF	0.372***	0.043**	0.406***	0.035	0.455***	0.073***	0.388***	0.043*
SURP	0.031**	0.239***	0.080***	0.450***	0.043*	0.397***	0.095***	0.479***
SIZE	-0.007***	-0.012***						
*SIZE*SURP*	0.148***	0.330***						
NEG SURP			-0.002**	-0.003***				
*NEG SURP*SURP*			-0.063	0.011				
NEG CF					0.022***	0.007		
*NEG CF*SURP*					0.511***	0.248**		
NET DEBT							0.002**	0.000***
*NET DEBT*SURP*							0.019	-0.069**
Adj. R^2	30.39%	31.44%	33.11%	30.30%	32.98%	30.09%	30.94%	33.09%
Adj. R^2-Model (2)	35.00%		35.00%		35.00%		35.00%	
Adj. R^2-Model (4)		32.24%		32.24%		32.24%		32.24%
Tests of coefficients restrictions								
Null Hypothesis	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat
$\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$	823.854		436.239		742.482		472.329	
$\beta_1 = \beta_2 = \beta_3 = \beta_4$	349.225		420.433		251.711		381.783	
$\varphi_1 = \varphi_2 = \varphi 3_1 = \varphi_4 = 0$		1030.685		348.378		340.244		678.612
$\varphi_1 = \varphi_2 = \varphi 3_1 = \varphi_4$		599.152		307.441		168.745		565.112
N	2159	2159	2159	2159	2159	2159	2159	2159

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *SURP* is annual surplus or deficit, as reported in the statement of operations. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. Models (2.1) and (4.1) are estimated using the generalized least squares technique. *CONTROL* refers to the following dummy variables: *SIZE* is equal to 1 if the population of a government is more than the median, and 0 otherwise; *NEG SURP* is equal to 1 if *SURP* < 0, and 0 otherwise; *NEG CF* is equal to 1 if *CF* < 0, and 0 otherwise; *NET DEBT* is equal to 1 if the ratio of net debt-to-total annual revenue is more than the median, and 0 otherwise. The *t*-statistic is based on White's (1980) robust standard errors. All variables are scaled by total assets at year-end. *, **, *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively. *N* is the number of government-year observations.

Table 8

The usefulness of surpluses in explaining future cash flows and future surpluses by provinces

$$\text{Model (2.2)}: CF_{it+1} = \beta_0 + \beta_1 CF_{it} + \beta_2 SURP_{it} + \beta_3 PROVINCE_{it} + \beta_4 PROVINCE * SURP_{it} + \varepsilon_{it}$$

$$\text{Model (4.2)}: SURP_{it+1} = \varphi_0 + \varphi_1 CF_{it} + \varphi_2 SURP_{it} + \varphi_3 PROVINCE + \varphi_4 PROVINCE * SURP_{it} + \varepsilon_{it}$$

Variable	Alberta		British Columbia		Manitoba		New Brunswick	
	Model (2.2)	Model (4.2)	Model (2.2)	Model (4.2)	Model (2.2)	Model (4.2)	Model (2.2)	Model (4.2)
Intercept	0.034***		0.037***	0.015***	0.034***	0.015***	0.037***	0.018***
CF	0.369***	0.085***	0.361***	0.063**	0.376***	0.066***	0.318***	0.048***
SURP	0.086***	0.292***	0.045**	0.346***	0.057***	0.357***	0.047***	0.286***
AB	-0.002	0.000						
*AB*SURP*	-0.039	0.266***						
BC			-0.015***	-0.005***				
*BC*SURP*			0.181***	0.203***				
MB					-0.035***	-0.029***		
*MB*SURP*					-0.082	0.157		
NB							-0.003	-0.011***
*NB*SURP*							0.341***	0.294***
Adj. R^2	28.29%	32.48%	37.72%	24.40%	27.52%	24.64%	21.08%	17.93%
Adj. R^2-Model (2)	35.00%		35.00%		35.00%		35.00%	
Adj. R^2-Model (4)		32.24%		32.24%		32.24%		32.24%
Tests of coefficients restrictions								
Null Hypothesis	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat
$\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$	1258.336		1087.9		528.307		729.00	
$\beta_1 = \beta_2 = \beta_3 = \beta_4$	1125.40		261.709		502.262		263.461	
$\varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = 0$		643.75		375.90		351.550		254.841
$\varphi_1 = \varphi_2 = \varphi_3 = \varphi_4$		445.171		304.762		321.984		234.579
N								

(Continued)

Table 8 (Continued)

Variable	Nova Scotia		Ontario		Quebec		Saskatchewan	
	Model (2.2)	Model (4.2)	Model (2.2)	Model (4.2)	Model (2.2)	Model (4.2)	Model (2.2)	Model (4.2)
Intercept	0.034***	0.015***	0.035***	0.02***	0.034***	0.015***	0.034***	0.015***
CF	0.371***	0.065***	0.388***	0.137***	0.349***	0.077***	0.380***	0.068***
SURP	0.048***	0.349***	0.048***	0.210***	0.070***	0.360***	0.053	0.354***
NS	-0.002	-0.003						
*NS*SURP*	0.228	0.114						
ON			-0.004***	-0.011***				
*ON*SURP*			0.017	0.120				
QC					0.004***	-0.003		
*QC*SURP*					-0.006	-0.005		
SK							0.005	0.005
*SK*SURP*							0.079	0.104
Adj. R^2	23.83%	21.81%	45.63%	32.42%	45.01%	29.07%	25.53%	22.05%
Adj. R^2-Model (2)	35.00%		35.00%		35.00%		35.00%	
Adj. R^2-Model (4)		32.24%		32.24%		32.24%		32.24%
Tests of coefficients restrictions								
Null Hypothesis	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat	χ^2 stat
$\beta_1=\beta_2=\beta_3=\beta_4=0$	347.380***		423.640		345.641		328.049	
$\beta_1=\beta_2=\beta_3=\beta_4$	336.266***		409.860		275.412		267.511	
$\varphi_1=\varphi_2=\varphi_3=\varphi_4=0$		168.00***		153.137		512.025		211.655
$\varphi_1=\varphi_2=\varphi_3=\varphi_4$		167.989***		118.879		232.876		124.607
N								

Variable definition: *CF* is net cash flow from operating activities, as disclosed in the statement of cash flow. *SURP* is annual surplus or deficit, as reported in the statement of operations. *ACC* is total accruals calculated as the difference between *SURP* and *CF*. Models (2.2) and (4.2) are estimated using the generalized least squares technique. *PROVINCE* refers to the following dummy variables: *AB* is equal to 1 if the local governments are located in the province of Alberta, and 0 otherwise; *BC* is equal to 1 if the local governments are located in the province of British Columbia, and 0 otherwise; *MB* is equal to 1 if the local governments are located in the province of Manitoba, and 0 otherwise; *NB* is equal to 1 if the local governments are located in the province of New Brunswick, and 0 otherwise; *NS* is equal to 1 if the local governments are located in the province of Nova Scotia, and 0 otherwise; *ON* is equal to 1 if the local governments are located in the province of Ontario, and 0 otherwise; *QC* is equal to 1 if the local governments are located in the province of Quebec, and 0 otherwise; *SK* is equal to 1 if the local governments are located in the province of Saskatchewan, and 0 otherwise. The *t*-statistic is based on White's (1980) robust standard errors. All variables are scaled by total assets at year-end. **, *** indicate statistical significance at the 0.05 and 0.01 levels, respectively. *N* is the number of government-year observations.