

MEASUREMENT OPERATIONALIZATION AND WRITTEN CLARITY IN ACCOUNTING RESEARCH: AN INTEGRATED PEDAGOGICAL APPROACH FOR A DOCTORAL RESEARCH SEMINAR



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ABSTRACT

The purpose of this paper is to provide an integrated pedagogical approach that professors can use with doctoral students to immerse students in a decision-making process that is critical to a successful research project: variable operationalization. Using articles from well-regarded journals to evaluate the operationalization choice of the "restatement" variable, the authors assemble a pedagogical approach that includes exercises professors can use with doctoral students. The setting chosen explores three methods used to operationalize the financial restatement variable in empirical archival accounting literature that students can explore: announcement date, first occurrence, and all occurrences. Students are first tasked with identifying the elements influencing measurement choice. Next, students assess whether findings reveal that statistically distinct results arise from each of the three measurement choices evaluated. Finally, students come to realize that an incorrect measurement choice may subject research findings to reductions in explanatory power, risk of type 1 and type 2 errors, and altered direction (sign) of coefficients. Achieving clarity in measurement choice and exposition are challenges inherent in accounting scholarship. This pedagogical approach helps nascent scholars work through these challenges using an actual empirical research setting, i.e., financial restatements. The insights gained can be applied by doctoral students in their own research efforts.

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SECTION 1

OPERATIONALIZING THE FINANCIAL RESTATEMENT VARIABLE: AN INTEGRATED PEDAGOGICAL APPROACH FOR A DOCTORAL RESEARCH SEMINAR

Successfully navigating a doctoral business program requires students to absorb information on a wide range of research topics and techniques while also learning to think critically about the specific details of a given research question or published study. The typical doctoral program in a college of business will offer discipline-specific seminars, e.g., accounting, finance, management, marketing, etc. Accounting faculty, for instance, who lead these discipline-specific seminars expose students to a combination of recent work and seminal studies in a given area (tax, managerial, financial, audit, etc.). Students endeavor to absorb the theories and findings across a large body of accounting scholarship in preparation for their comprehensive examinations and as a needed precursor to selecting a dissertation topic. An important

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element that links the general methods with the discipline-specific research setting is the operationalization of key variables. There is a gap in accounting educational literature when it comes to helping students link their general methods knowledge with the discipline-specific research covered in their seminars. The purpose of this paper is to focus on one aspect of this linkage - thinking critically about measurement choices. This pedagogical approach addresses this objective in four steps.

This paper provides a guided replication exercise to increase students' understanding of the clarity and precision of thought necessary for operationalizing measurement choices. First, the exercises in this pedagogy require that students review prior literature that employs the likelihood of financial restatement as a proxy for audit quality. During this literature review, students perform a detailed review of three articles. Each of the selected articles operationalizes the restatement variable differently. Working in small teams the students identify the different approaches and explore the relationship between the research question proposed and the restatement measurement approach employed. Second, these exercises require that the student teams analyze how each of the three papers discuss the details of their respective measurement approach. Through this exploration they discover the need for writing clarity in order to permit future researchers to evaluate, replicate, and extend a study. Based on this review the teams propose best practices for authors to consider when reporting measurement information. Third, student teams will complete a structured replication assignment to determine if the three different measurement choices influence the results of a typical restatement model (spoiler alert – they do). This reinforces the need for thorough and careful deliberation by scholars when making variable operationalization choices. Finally, guidance is provided to assist instructors in adapting the example exercise to other settings, such as a financial, managerial, or tax seminar.

ACCOUNTING DOCTORAL EDUCATION

Recent accounting education journals have addressed a variety of doctoral education concerns by summarizing demographic data from different Ph.D. programs (Baldwin et al., 2010), describing doctoral program characteristics (Brink & Quick 2016), and illuminating components that impact initial placement of accounting Ph.D. graduates (Stammerjohan et al., 2009). Scholars have also discussed pedagogical training for accounting doctoral students focused on how to teach (e.g., Abdullah et al., 2016). With respect to scholarly research skill development, Collins et al. (2019) discusses benefits of accounting research reading groups, which support accounting doctoral students' immersion in the relevant research. Newmark et al. (2007) offers a researcher-reviewer method for tax research projects suggesting it may increase students' ability to successfully conduct relevant research. In this paper, we address the relationship between the research question posed and measurement operationalization choices made by scholars. We offer an integrated pedagogical approach that instructors of doctoral seminars may use to help students understand this critical decision. This pedagogy also illustrates the need for clear and complete descriptions of the measurement choices in academic writing. Documenting the details of the reviewed measurement approaches helps students more fully grasp the link between measurement description clarity and the reader's ability to understand, evaluate, and replicate or extend the research.

Doctoral programs focus on statistical models such as linear regression, logistic regression, and discriminant analysis. While the statistical models are very important, nascent scholars may take the measurement operationalization approach in a scholarly article for granted. Doctoral programs also provide seminars where research papers in various accounting disciplines are discussed. While findings of those studies are discussed and research methods are critiqued, the doctoral students may not feel confident in their knowledge and experience to critique the written clarity (or lack of clarity) in these published papers. In this paper, we provide a pedagogical approach that contains a series of activities for use by professors teaching doctoral research seminars. This series of activities stresses the importance of clarity in measurement choice and clarity of writing in the critical step of operationalizing key variables. The goal of the learning strategy is to improve doctoral students' critical thinking and writing with respect to measurement choices.

Replicating prior empirical research is a rite of passage for doctoral students and an increasingly common element of analytical classes for master of accountancy students. Courses in econometrics, time series data, structural equation modeling, etc. rely in part on replication assignments to aid students in integrating important concepts such as statistical significance, correlation, difference in means, and regression. These exercises also develop students' skills using statistical software, e.g., SAS, Stata, SPSS, r, etc. Additionally, these assignments can be structured, depending on the skill level of the student, to mask or expose students to the challenges inherent in downloading, merging, and cleansing data from common empirical data sources such as Compustat, CRSP, and Audit Analytics. Anecdotal evidence suggests that the use of replication assignments is pervasive.

GUIDED REPLICATION

We propose an extension to the traditional replication assignment – replication with an emphasis on measurement choice. Typical replication assignments take as a given the published research model and its inherent measurement choices. The proposed exercise in our pedagogical approach directs students to explicitly examine and test alternative operationalization approaches. This enhances the value of the replication exercise, encouraging deeper and more critical thinking around measurement choices made in empirical research. Based on the articles selected for review, the students become aware of the need for clarity and precision in scholarly writing.

Many important accounting research constructs are operationalized in multiple ways. In financial accounting research, earnings quality measures include persistence, predictability, abnormal accruals, accruals quality (Dechow & Dichev, 2002), and value relevance measured via the earnings response coefficient. In tax research, tax aggressiveness measures consist of book effective tax rate, cash effective tax rate, total book-tax differences, and permanent book-tax differences. In managerial accounting, social responsibility of companies is assessed by various rankings such as Datastream, Morgan Stanley Capital International's GMI Ratings, and KLD scores from KLD Research & Analytics, Inc.

In attest research, audit quality is frequently proxied by variables such as discretionary accruals, U.S. Securities and Exchange Commission (SEC) comment letters, and financial restatements.

The lack of replication studies is especially problematic because empirical economic studies are often prone to error (Dewald et al., 1986; Anderson et al., 2005). Dyckman and Zeff (2014) investigate articles published in *The Accounting Review* and *Journal of Accounting Research* from September 2012 through May 2013. The authors conclude that statistical analyses in studies offered flawed results and did not properly rationalize the time periods in the papers. Replications of these studies using appropriate statistical methods and time periods may lead to different results. Hail et al. (2020) performed a survey among 2019 Journal of Accounting Research Conference partakers regarding their views of the causes, effects, and frequency of irreplicable research in accounting journals. Results show that sharing code and data along with greater incentives to reproduce others' work would improve replicability. We suggest a set of activities in this paper that an instructor may use to illustrate the importance of replicating prior research as well as the barriers related to completing a successful replication.

The enhanced replication assignment in this pedagogical approach provides a way to instill future researchers with the importance and value of replication. The value of replication exercises is often commented on in editorials, but not so often reflected in the works accepted and published by editors.

The growing use of restatements in accounting research as a proxy for issues with financial reporting and audit quality supports the use of this setting for the instructional activities provided. There are three common measurement approaches: announcement date (AD), first occurrence (FO), and all occurrence(s) (AO). Working in small groups, students review selected articles and discover these different measurement approaches. Based on this analysis we propose guidelines for choosing the measurement approach that may best apply to the research question(s) being explored. Students also critique the clarity of writing and propose guidelines for describing measurement choice in a scholarly paper. For example the students may conclude that, for a paper employing restatements a sufficient description might include: 1) clearly stating the measurement method, e.g., AD, FO, or AO, 2) explaining why this measurement choice fits the research question, and 3) providing an example of how measurement is operationalized. Absent this information, the reader may be confused by and lack confidence in the findings of a study.

A typical restatement announcement implicates financial data for several periods, requiring multiple financial reports to be restated. Thus, a single restatement announcement often reveals that multiple financial reporting and audit failures have occurred. For example consider Siga Technologies, Inc., a PricewaterhouseCoopers client, who disclosed on 5/10/2013 via 8-K that it was restating financials for the 1/1/2010 - 12/31/2012 time period. An announcement date approach considers this a single restatement occurring in 2013, while a first occurrence approach would record a single restatement observation in 2010. However, since Siga Technologies, Inc. restated financials in 2010, 2011 and 2012, other scholars interested in financial reporting and audit quality count all occurrences recording this as three restatements and attribute each restatement occurrence to its respective year.² Based on the Siga Technologies, Inc. example, using announcement date (AD) or first occurrence (FO) shifts the timing of the restatements and suppresses the restatement rate compared to the all occurrences (AO) approach³.

Figure 1 shows the number of restatements each year employing the three approaches for the audits conducted by the Big 4 and tier-2 global firms.

* * * Insert figure 1 here * * *

Based on an inductive analysis of selected articles reviewed from top-tier accounting journals, student teams propose guidelines for scholars to consider when deciding how to operationalize the restatement variable in a particular research setting. For example they might suggest that:

All Occurrences (AO) is typically used to determine the impact on audit and financial reporting quality of an ongoing client, auditor, and/or business attributes, for instance, auditor office size or expertise.

As noted above, Figure 1 demonstrates significant differences in the timing and volume of restatements depending on how the phenomena is measured. Inherent in these concerns is the assumption that empirical analysis findings will be sensitive to the restatement measurement approach choice. In other words, we should care about the choice accounting scholars made (make) in measuring restatements. The exercise lets students explore this question by evaluating a restatement model using the three different measurement approaches. The analysis of the resulting differences reinforces the impact of measurement operationalization choices. It highlights the need for scholars to critically examine these choices as both producers and consumers of published research.

The remainder of the paper is organized as follows: Section two comprises the student exercise material, including background reading on the restatement process, activities on measurement choice, clarity in documenting measurement choices, and the model, data, and SAS code needed to replicate a typical restatement analysis using the three common approaches to operationalizing the restatement variable. The third section of this paper provides exercise notes to assist the instructor. The fourth section discusses adapting the exercise for different settings, e.g., financial, managerial, and tax. An appendix provides notes on common issues found when compiling and merging restatement data from the Audit Analytics and Compustat databases.

² This restatement example is based on data from the Restatement screen in the Audit Analytics database.

³ In addition to the choice of how to operationalize restatement occurrence (AO, AD, FO), researchers may elect to limit the sample to certain types of restatements; for instance how the restatement is disclosed (Big R versus little r), impact of the restatement on net income, or the underlying cause of the restatement (fraud and irregularities versus errors).

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SECTION 2

OPERATIONALIZING THE FINANCIAL RESTATEMENT VARIABLE: AN INTEGRATED PEDAGOGICAL APPROACH FOR A DOCTORAL SEMINAR

1. Learning objectives

During this series of exercises, we will explore the different choices accounting scholars make when operationalizing the financial restatement variable in audit quality research. Upon successful completion you will:

- Understand the interrelationship between the research question and the measurement choices researchers make when employing restatements as a proxy for audit quality,
- Confirm that making a different measurement choice may significantly alter the findings,
- Extend the insight gained to the critical evaluation of other variables and other research settings,
- Appreciate the precision, detail, and clarity that well-crafted research papers employ in describing their measurement choices and how they operationalized the variables in their models.

2. Background: The use of restatements in empirical audit quality research

Accounting scholars have explored the impact of financial restatement announcements on markets, investors, regulators, boards of directors, management, and other stakeholders (Wilson, 2008; Srinivasan, 2005; Desai et al., 2006; Gleason et al., 2008). Additionally, auditing scholars have employed financial restatements as a proxy measure of financial reporting and audit quality (DeFond & Zhang, 2014). The common approach within the literature exploring a restatement's impact on company value, i.e. stock price, has been to examine the market reaction to a restatement announcement (e.g., Palmrose et al., 2004). A noticeable portion of the financial reporting and auditing research has followed this approach.

Accounting restatements occur for various reasons including fraud, error by the company, unclear accounting standards, and highly complex transactions (Plumlee & Yohn, 2010). Regardless, auditors have a "responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud" (AICPA - SAS No.1, 1972). Thus, restatements represent an audit as well as a management reporting failure.

A base restatement rate is likely to be inherent in the current environment. This observation is based on: the current complex business and regulatory environment; the desire for cost effective audits, i.e., standards focused on achieving reasonable, not absolute, assurance; and the state of existing audit practices, technologies, and techniques. Added to this base rate are variations due to differences in industry, management, governance, internal controls, audit practices, people, and Certified Public Accounting (CPA) firms. It is in this context, as a measure of financial reporting and audit quality, that many researchers employ restatements as a dependent variable (DV).

In addition to restatements, other audit quality measures have been utilized, such as: accruals quality (Myers et al., 2003), shareholder litigation (Palmrose, 1988), SEC investigation or sanction (Dechow et al., 1996), Big 4 office size (Francis & Yu, 2009), individual auditors (Gul et al., 2013), and going concern opinions (Francis & Krishnan, 2002). Restatements are an attractive measure of financial reporting and audit quality vis-à-vis these alternatives because they are

unambiguous, readily available, and somewhat nuanced (DeFond & Zhang, 2014). Depending on the nature of the research question being explored, restatement samples may be subdivided to highlight restatements that reduce income, impact core accounts, are caused by errors, or result from irregularities.

The impact of auditor differences on restatement risk has been explored. Industry expertise and office size influence restatement rates with larger Big 4 accounting offices and those accounting offices with relevant industry expertise providing better quality audits, that is, fewer restatements, than smaller, less expert offices (Stanley & DeZoort, 2007; Romanus et al., 2008; Francis et al., 2013). Abnormally low audit fees – that may be indicative of the auditor underestimating the risk or effort – are correlated with an increase in restatements (Blankley et al., 2012). Furthermore, auditor tenure is inversely related to the likelihood of a restatement (Stanley & DeZoort, 2007).

Research on audit firms' scope of services has also employed restatements. Findings on the relationship between non-audit services (NAS) and restatements are mixed with little evidence to link client restatements to the level of NAS provided for the client by its auditor (Raghunandan et al., 2003; Kinney et al., 2004; Bloomfield & Shackman, 2008). Recent work suggests that providing NAS to attest clients may create knowledge spillovers that improve audit effectiveness and efficiency, reducing restatements (Knechel & Sharma, 2012).

Tax researchers have explored the relationship between tax-related issues and restatements. Tax-related issues have been a leading cause of restatements and continue to effect companies (U.S. Government Accountability Office, 2006; Plumlee & Yohn, 2010; Deloitte, 2011; Ernst & Young, 2012; EY Center for Board Matters, 2015). The results of Choudhary et al. (2016) document an association between low tax accrual quality and future tax-related restatements. Seetharaman et al. (2011) investigate the association between auditor-provided non-audit tax services and financial reporting quality for public companies in a post Sarbanes-Oxley environment. They find a significant negative association between auditor-provided non-audit tax services and tax-related financial statement restatements, suggesting the benefits of auditor-provided non-audit tax services seem to manifest themselves in higher-quality tax-related financial statement management assertions. These studies provide anecdotal and empirical evidence of an association between tax-related restatements and the complexity and nuances of tax accounting.

Prior research also examines the association between accrual quality and restatements. Dechow et al. (2011) provide evidence that accrual quality is low at the time of misstatements. Ettredge et al. (2010) provide evidence of meaningful earnings management in the two years prior to a restatement. While earnings management is systematic for firms prior to the issuance of a fraudulent financial report, they find aggressive accounting choices also occur prior to non-fraudulent restatements. Overall, this literature finds a positive relationship between aggressive financial reporting and restatements.

Researchers have investigated the causes and impacts of the disclosure venue choice of restatement, i.e., Big R versus little r restatements. Scholz (2014) defines a Big R restatement as one disclosed in item 4.02 of Form 8-K. Alternately, a little r restatement is a non-4.02 restatement. Little r restatements result from SEC's Staff Accounting Bulletin No. 108 (SAB 108), issued in September 2006. See <https://www.sec.gov/oca/staff-accounting-bulletin-108> (SEC, 2006) for details. SAB 108 requires that companies consider the cumulative effect of multiple-year errors to determine whether a restatement is necessary. If a series of errors results in a cumulative error that is material, prior results must be restated, even if the effect on any one period is immaterial. Furthermore, SAB 108 specifies that the resulting restatements may be made in subsequent, regularly scheduled financial statements (10-Ks and 10-Qs) rather than in amended filings. By mandating consideration of the cumulative effect of relatively small errors, SAB 108 likely increased the number of non-4.02 restatements. Tan and Young (2015) find that little r firms are generally more profitable, less complex, and show some evidence of stronger corporate governance and higher audit quality than Big R firms. They also find that the majority of little r firms do not include any discussion of why those little r's occurred. Hogan & Jonas (2016) find evidence that managers with pay structures favoring equity are more likely to judge a restatement as not material enough to trigger an 8-K filing. Additionally, their research suggests potential benefits from not aligning the pay structures of the CEO and CFO.

Thus, we see that restatements are a useful proxy for financial reporting and audit quality; applicable to a wide variety of research questions.

2.1 Restatement process

Restatements represent a material failure to apply U.S. Generally Accepted Accounting Principles (GAAP). That failure's unfortunate genesis is an accounting misstatement undetected by internal controls and external audit that is ultimately reflected in published financial reports (Eilifsen & Messier, 2000). Hennes et al. (2008) report the preponderance of restatements are caused by errors, 76%, versus irregularities, 24%.

The existence of an error in financial reports does not, per se, trigger the requirement to restate. Errors are subject to materiality considerations; thus, minor errors may be corrected going forward without the formal restatement process.

In August 2004, the U.S. Securities and Exchange Commission (SEC) issued a Final Rule requiring an additional Form 8-K disclosure requirement and acceleration of filing dates. The new rule required that on discovery of a material error or omission in published financial data, SEC registrants are required to report via form 8-K Item 4.02, "Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review." Typically, this reporting must be filed within four business days of the event triggering the filing requirement, i.e., determining the financial statements are in error. See <http://www.sec.gov/rules/final/33-8400.htm> (SEC, 2004) for specific details. These 4.02 restatements are known as "Big R" restatements.

Generally, the company and auditor work together to investigate and correct the matter. Once resolved, the implicated financial reports are restated and amended versions of the relevant forms, e.g., 10-K/A, 10-Q/A, are filed.

In practice, the prescribed sequence of events may be altered, for instance, restating prior periods' results in the current 10-K if that is deemed a timelier way to distribute the information (Taub, 2012). Scholz (2014) reports an increasing trend in non-4.02, also known as "little r," restatements from 39% in 2005 to 65% in 2012 of the total announced restatements.

2.2 Data sources

Much of the early work on restatements required researchers to manually compile restatement data. This entailed collecting data from press reports, SEC sources, annual reports, and proprietary financial analyst databases. The process was simplified with the creation of two datasets by the General Accounting Office (GAO). These data, GAO-03-395R, Jan 17, 2003 and GAO-06-1053R, Aug 31, 2006, comprised 919 and 1,786 restatements respectively, and were an analytical boon to researchers. Currently many research studies employ the Audit Analytics database as their starting point for restatements information. As of March 6, 2020, Audit Analytics contained information on over 18,000 restatement announcements and/or non-reliance filings by over 10,000 unique filers (Whalen et al., 2020). The database contains information from January 1, 2001 to the present.

The need to restate prior financials is discovered over time; that is, after the reports have been published. In 2017, restatements spanned an average period of 509 days (<https://blog.auditanalytics.com/2017-financial-restatements-review/>) (Audit Analytics, 2018). Many researchers allow at least a three-year lag to permit time for this discovery (e.g., Francis et al., 2013). For example, a research project undertaken in 2020 examining the percentage of published financial reports that are restated might work with restatements data up through year-end 2017.

Most research combines the restatement data with financial information from the Compustat database and often includes additional data from other sources pertinent to the specific research question. The merge process between Compustat and Audit Analytics data is not as straightforward as it first appears. The two databases handle non-standard (not 12/31) fiscal year ends differently. The unwary may inadvertently have restatements from one year matched with financial data from a different year. Additionally, while Audit Analytics provides the restatement announcement date and the beginning and ending dates for the restatement period, it is left to the researcher to compute the specific periods (years) that were restated. Please see the Appendix for a more detailed discussion.

3. Research review activities

3. a. Please read the three articles listed below and answer the following questions:

- a. What is the research question(s) that each article is exploring?
- b. What are the findings?
- c. How was the restatement variable operationalized, i.e., measured? Include the passage(s) that describe what the authors did, i.e., where did the data come from, how was it transformed, counted, coded, etc.
- d. In your view, which of the three papers provided the most useful description of the measurement approach for restatements?

Laurion, H., Lawrence, A., & Ryans, J. P. (2017). US audit partner rotations. *The Accounting Review*, 92(2), 209-237. <https://doi.org/10.2308/accr-51552>

Boland, C. M., Bronson, S. N., & Hogan, C. E. (2015). Accelerated filing deadlines, internal controls, and financial statement quality: The case of originating misstatements. *Accounting Horizons*, 29(3), 551-575. <https://doi.org/10.2308/acch-51075>

Francis, J. R., Michas, P. N., & Yu, M. D. (2013). Office size of Big 4 auditors and client restatements. *Contemporary Accounting Research*, 30(4), 1626-1661. <https://doi.org/10.1111/1911-3846.12011>

Be prepared to discuss the following:

- a. How were the three papers' restatement measurement choices similar?
- b. In what respects did the three papers' restatement measurement choices differ?
- c. Why did the authors choose their particular measurement approach?
- d. Do you agree or disagree with the restatement approach taken by each paper?
- e. To the extent that the papers' operationalization of the restatement variable differs, does that make the results less valid? Harder to compare? More difficult to replicate? More confusing to the reader?

As a result of the group discussion please summarize:

- The three restatement measurement approaches in the three articles above and the types of research questions that each approach might best fit,
- Guidelines for reporting how a variable of interest is operationalized.

3. b. Based on the results of the prior discussion, please review the following three articles listed below and determine if:

- a. The authors explained why the restatement measurement approach chosen fit the research question?
- b. The authors provide an example of how restatements were operationalized?

Larcker, D. F., Richardson, S. A., & Tuna, I. R. (2007). Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review*, 82(4), 963-1008. <https://doi.org/10.2308/accr.2007.82.4.963>

McGuire, S. T., Omer, T. C., & Sharp, N. Y. (2012). The impact of religion on financial reporting irregularities. *The Accounting Review*, 87(2), 645-673. <https://doi.org/10.2308/accr-10206>

Demerjian, P. R., Lev, B., Lewis, M. F., & McVay, S. E. (2013). Managerial ability and earnings quality. *The Accounting Review*, 88(2), 463-498. <https://doi.org/10.2308/accr-50318>

4. Replication

The prior material suggests that scholars select differing restatement measurement approaches based on the nature of their specific research question. It is fair to ask, does it matter? Using the dataset and SAS code provided, please run the probit regression model shown below using three different financial restatement measurement approaches as the dependent variable – Announcement Date (AD), First Occurrence (FO), and All Occurrences (AO).

The model uses restatement as the dependent variable and includes predictors from prior research related to auditor, industry, and company factors. It is similar to models used in prior research (Ettredge et al., 2006; Hoitash et al., 2007; Francis et al., 2013). The following probit model is used to compare the alternative restatement measurement approaches:

$$\text{Probability (RESTATEMENT)}_{2003-2015} = \beta_0 + \beta_1 \text{OFFICE_SIZE} + \beta_2 \text{BIG4} + \beta_3 \text{CLIENT_IMPORTANCE} + \beta_4 \text{CITYEX} + \beta_5 \text{NATEX} + \beta_6 \text{SHORT_TENURE} + \beta_7 \text{LNAUDITFEES} + \beta_8 \text{LNNAF} + \beta_9 \text{LNASSETS} + \beta_{10} \text{BM} + \beta_{11} \text{BUSY} + \beta_{12} \text{EXTINC} + \beta_{13} \text{FOREIGN} + \beta_{14} \text{GOING_CONCERN} + \beta_{15} \text{LEVERAGE} + \beta_{16} \text{LOSS} + \beta_{17} \text{REC} + \beta_{18} \text{ROA} + \beta_{19} \text{SEGMENTS} + B_{20} \text{WEAKNESS} + \text{Industry Fixed Effects} + \text{Year Fixed Effects} + \text{Audit Firm Fixed Effects} + \varepsilon$$

(1)

Report the results of each run of the model using the excel table provided.

If we were interested in determining the role a new audit firm (SHORT_TENURE) had on audit quality, as proxied by restatement risk, would how we operationalized the restatement variable matter? Which of the three models would be best for this research question? Why? What if we were interested in the impact of non-audit fees (LNNAF) on restatement risk?

[Dataset | Variables](#)

[SAS Code](#)

[Results Table](#)

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SECTION 3

INSTRUCTOR NOTES:

OPERATIONALIZING THE FINANCIAL RESTATEMENT VARIABLE: AN INTEGRATED PEDAGOGICAL APPROACH FOR A DOCTORAL SEMINAR

Use of student teams

Much of today's accounting research is produced by a team of authors. Modeling this structure, we suggest that two or three students work as a team in completing the activities.

Review learning objectives

For doctoral students who will soon begin teaching in classrooms, instructors may wish to discuss briefly the use of learning objectives to focus student and instructor attention on critical course outcomes.

Background reading

A general discussion of the use of restatements in audit quality research is provided as a starting point. Instructors may wish to edit the background reading to better match the focus and needs of their seminars.

Activity

The three papers assigned are examples of three distinct approaches to operationalizing the restatement measurement: Announcement Date (AD), First Occurrence (FO), and All Occurrence(s) (AO). Via an instructor-facilitated discussion around the prompts provided, the students find that the nature of the research question best determines the specific measurement approach. The students are encouraged to develop guidance on when each approach might be appropriate, i.e., What types of questions are best addressed by each measurement approach. The instructor may wish to review Figure 1 with the students. This can be used to support a discussion of the impact of the alternative measurement approaches on the number and timing of restatement observations. During this discussion, students may realize that the announcement date and first occurrence operationalization approaches reduce the number and shift the timing of the observations compared to the all occurrences method. Additional details for guiding the discussion are summarized below:

Discussion summary – Measurement choices

Example:

Laurion, H., Lawrence, A., & Ryans, J. P. (2017). US audit partner rotations. *The Accounting Review*, 92(2), 209-237. <https://doi.org/10.2308/accr-51552>

Research questions: Is audit partner rotation linked to the following:

- a. Financial statement detections and disclosures?
- b. A decrease in restatements?
- c. Write-downs and special items?
- d. Reserves and valuation allowances?

Findings: Compared to firms that do not rotate audit partners, firms that do rotate auditors may undergo a fresh look. While there is no evidence of a change in the occurrence of misstatements (restatement periods) subsequent to the partner rotation for firms that rotate audit partners, their results suggest an increase in the occurrence of restatement discoveries and announcements for firms that rotate audit partners. For these firms, the authors find a rise in deferred tax valuation allowances.

Announcement date (AD): This approach focuses on the timing of discovering and disclosing a restatement. It is often used when examining the post-hoc impact of company or auditor changes on restatements.

- Examples include the impact on restatement likelihood of:
 - Auditor or audit partner turnover,
 - Auditor tenure,
 - Client merger or acquisition,
 - Multiple prior restatement announcements.
- By employing the AD measure of restatements researchers can evaluate the timing and dynamics impacting the disclosure of audit and financial reporting quality issues.

Example:

Boland, C. M., Bronson, S. N., & Hogan, C. E. (2015). Accelerated filing deadlines, internal controls, and financial statement quality: The case of originating misstatements. *Accounting Horizons*, 29(3), 551-575. <https://doi.org/10.2308/acch-51075>

Research questions: Do regulations mandating “accelerated filing deadlines and internal control reporting and testing” (p. 551) impact the reliability of financial statements? Are these legislative changes related to an increase in the probability that Misstatements are initiated in the period subsequent to the respective legislative change?

Findings: Accelerated filers (AFs) experience a rise in the probability of an originating misstatement subsequent to the acceleration of filing deadlines from 90 to 75 days. However, large accelerated filers (LAFs) do not have a similar rise subsequent to this acceleration or the successive acceleration from 75 to 60 days. Following the employment of the SOX Section 404 internal control mandates, the probability of an originating misstatement dropped for AFs but not for LAFs. Collectively the findings indicate that, although AFs experienced an initial decline in the reliability of the financials, this decline was temporary.

First occurrence (FO): This measurement focuses on timing of the error or omission. It can detect the impact of an exogenous change on likelihood of restatement.

- Examples include the impact on audit quality of:
 - New regulations or interpretation of regulations such as SOX 404,
 - Changes in accounting treatment, for instance, new revenue recognition rules,
 - Tax code changes.
- By employing the FO measure of restatements researchers can compare the pre- and post-impact of a specific change on audit and financial reporting quality. It nicely supports a difference-in-difference analysis.

Example:

Francis, J. R., Michas, P. N., & Yu, M. D. (2013). Office size of Big 4 auditors and client restatements. *Contemporary Accounting Research*, 30(4), 1626-1661. <https://doi.org/10.1111/1911-3846.12011>

Research question: Are Big 4 accounting firms able to attain consistent audit quality across their offices, especially for smaller offices in terms of those that have a comparatively small number of SEC registrants as audit customers?

Findings: Larger Big 4 offices, in terms of SEC registered clients, have fewer client restatements. Small audit offices have more low-quality audits [restatements] than large offices of Big 4 and 2nd tier firms.

All occurrences (AO): This measurement approach provides the most inclusive measure of audit quality. It is typically used to determine the impact on audit and financial reporting quality of ongoing client, auditor, and/or business attributes.

- Examples include the impact on audit quality of:
 - CFO characteristics such as gender and narcissism
 - Corporate governance, corporate social responsibility behaviors, board of directors’ attributes,
 - Audit committee attributes,
 - Auditor office size, and
 - Auditor expertise

By employing the AO measure of restatements researchers can evaluate the audit quality impact of specific ongoing client, auditor, and/or business attributes.

Discussion summary – Clear writing

As nascent authors of scholarly papers, doctoral students benefit by appreciating the value of incorporating a clear explanation of measurement method(s) employed in their research. We suggest discussing the text below from Boland et al. (2015, p. 558). Ask the students to identify key elements needed in reporting how variables are operationalized. Emphasize that this information allows scholars to evaluate, replicate, and extend a research study.

“Our dependent variable, MISSTATE, equals 1 if the respective fiscal year is ultimately restated, and 0 otherwise. We only retain “originating misstatements,” defined as a Misstatement that begins during the regulatory period in order to be able to attribute the misstatement to the acceleration or Section 404. Thus, we begin by determining the first period misstated for each restatement announcement and classify the observations in the appropriate regulatory period depending on the fiscal year-end date. For multi-year misstatements, we retain only the first misstated period and we drop all other misstated periods related to that particular restatement announcement. For example, if Company A restates its December 31, 2005 and December 31, 2006 financial statements, then the first misstated period occurs after Section 404 but before the second acceleration. We would retain the Company A observation for the December 31, 2005 year-end as a misstatement and drop the observation for the December 31, 2006 year-end.”

In the description above, the authors state that they are using the first occurrence approach. They explain why this is an appropriate method given their research question.

Additionally, they provide an example of how their specific measurement approach was implemented.

The discussion might generalize from this example that a high-quality description includes clearly stating 1) the specifics of the measurement method employed, 2) provides an example of how the method is applied, and 3) explains why the measurement method selected is appropriate for the research question.

The second part of this activity involves students assessing two questions from three research articles published in *The Accounting Review*. The two questions are: (1) Did the authors explain why the restatement measurement approach chosen fit the research question? (2) Did the authors provide an example of how restatements were operationalized?

The first article, Larcker et al. (2007), uses the FO restatement measurement choice and the answer to both questions is yes. The second article, McGuire et al. (2012), uses the AO measurement operationalization for restatements. The answer to question (1) is yes and the answer to question (2) is no. The third article, Demerjian et al. (2013), uses the AD restatement measurement choice. The answer to both questions is no.

Discuss the impact that writing clarity (or lack thereof) has on the ability of future researchers to evaluate and extend the findings presented by a paper. Precise measurement description is one of many elements authors must consider when drafting a paper. The instructor may ask students to suggest other aspects of papers they have read recently that they feel warrant particular attention.

Replication

Depending on the students' background the instructor may wish to have students run a logit instead of the probit regression. The data is provided in excel to support the use of alternative statistical software, e.g., Stata, SPSS, r, etc. The table below summarizes the results of analyzing three alternative restatement measurements. It can be used by the instructor to guide the students' discussion of the proposed questions.

If we were interested in determining the role a new audit firm (SHORT_TENURE) had on audit quality, as proxied by restatement risk, would how we operationalized the restatement measurement matter? Which of the three models would be best for this research question? Why? What if we were interested in the impact of non-audit fees (LNNAF) on restatement risk?

The objective of this discussion is to reinforce the importance of measurement choices; coming to a class agreement on the specific questions posed is not that critical. Once the discussion of the results winds down the instructor can pose the question: How can we extend the insight gained to the critical evaluation of other variables and other accounting research settings? Here the instructor can guide the discussion based on the specific class setting. Examples might include earnings quality, accrual quality, auditor expertise, and various measures of tax aggressiveness.

Completed Results

SECTION 4

ADAPTING EXERCISES TO OTHER SETTINGS:

OPERATIONALIZING THE FINANCIAL RESTATEMENT VARIABLE: AN INTEGRATED PEDAGOGICAL APPROACH FOR A DOCTORAL SEMINAR

While the insights gained are not limited to a specific research domain an instructor may wish to adapt the concept to better fit a given seminar. As previously noted, many important accounting research constructs are operationalized in multiple ways. In financial accounting research, earnings quality measures include persistence, predictability, abnormal accruals, accruals quality (Dechow & Dichev, 2002), and value relevance measured via the earnings response coefficient. In tax research, tax aggressiveness measures consist of book effective tax rate, cash effective tax rate, total book-tax differences, and permanent book-tax differences. In managerial accounting, social responsibility of companies is assessed by various rankings such as Datastream, Morgan Stanley Capital International's GMI Ratings, and KLD scores from KLD Research & Analytics, Inc. In attest research, audit quality is frequently proxied by measurements such as discretionary accruals, SEC comment letters, and financial restatements.

This particular exercise grew out of various audit quality related research projects that the authors have completed. Drawing from familiar research in their area of interest, an instructor can adapt the exercise to meet their needs.

APPENDIX

The information below is beyond the scope of this exercise, but may be useful in a doctoral seminar focused specifically on audit quality research.

Notes on compiling and merging restatement data

Most current studies use the Audit Analytics database as the primary source for restatement data and the Compustat database as the source for financial information. Key considerations in compiling restatement data are discussed below. Sample SAS code that deals with the issues described below is available upon request from the authors.

Compustat's fiscal year (FYEAR) variable is defined in a different manner than the way Audit Analytics defines fiscal year. In Compustat if the fiscal year-end date falls between the end of January and the end of May, then the FYEAR variable is the previous year. If the fiscal year-end date falls between the end of June and the end of December, then the FYEAR variable is the current year. For example, if the fiscal year-end date is May 31, 2007 then FYEAR is 2006. On the other hand, if the fiscal year-end date is October 31, 2007, then FYEAR is 2007.

The data obtained from Audit Analytics show that for all fiscal year-end dates between the end of January and the end of December, the current year is used as the fiscal year. So if (for example) we want to merge data for a company with a fiscal year-end of May 31, 2007, we will combine the 2007 data for Audit Analytics with the data for FYEAR 2006 in Compustat. For the empirical analysis in this paper we follow the Audit Analytics approach to defining fiscal year-ends and, as a result, we change the Compustat FYEAR format to match the Audit Analytics format, as needed.

Figure

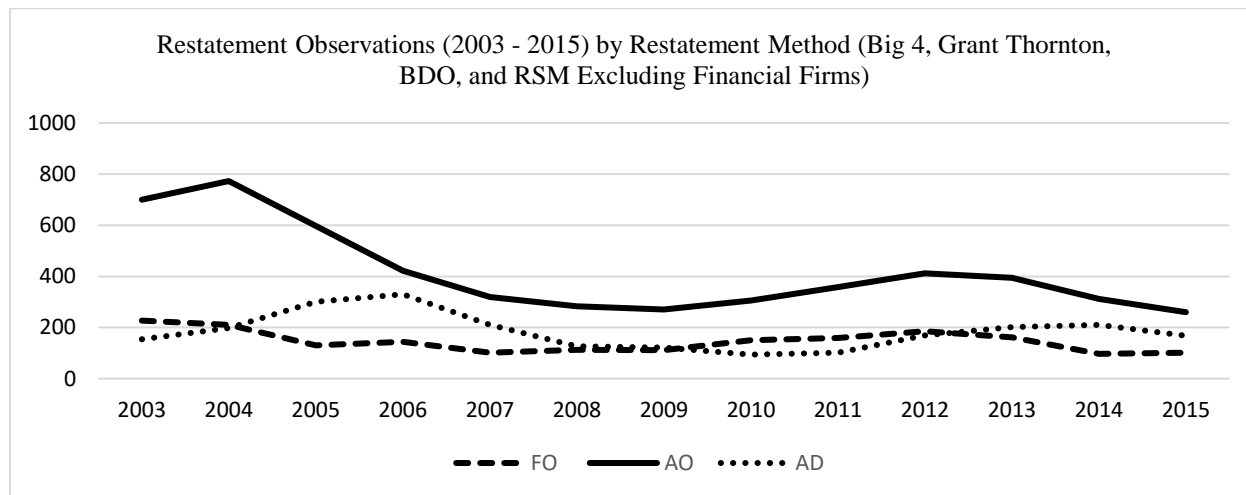


Figure 1. Restatement Observations (2003 - 2015) by Restatement Method (Big 4, Grant Thornton, BDO, and RSM Excluding Financial Firms)
 * Source: Audit Analytics, U.S. public companies, excludes unaudited (quarterly) data, financial industry and foreign filers.

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