The effect of accrual heterogeneity on accrual quality inferences

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Abstract: We investigate the impact of the mixed attribute GAAP measurement model on accrual quality inferences. GAAP rules vary from an income statement 'matching' focus to a balance sheet 'fair-value' focus. Accrual properties are also affected by the business activity being measured and the activity's recurrence. Furthermore, accrual measurement is affected by managerial estimation error/manipulation. As a consequence, accruals are heterogeneous with predictably different statistical properties. We construct a dataset of more than 100,000 accrual items that Compustat aggregates into data item, FOPO. We classify these accruals into 32 types over a 21-year span. We show that variation in persistence for the 32 accrual types is consistent with our predictions concerning GAAP rules. We provide a model of accruals and show that it is implausible for estimation error of reasonable magnitudes to explain this variation. Finally, we develop a measure of reporting consistency and show its impact on accrual quality inferences.

Keywords: accruals, earnings persistence, GAAP measurement rules, heterogeneity, accrual quality, cash flows, estimation error, consistency, matching, fair value

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I. INTRODUCTION

As any CPA, financial analyst, or even first-year accounting student appreciates, accruals are heterogeneous. The mechanical nature of debt premium amortization differs from the 'one-off' nature of asset impairment charges, which differs from the random nature of foreign exchange adjustments. These cross-sectional differences, however, have little to do with reporting discretion and more to do with firms' operating activities and the measurement rules of Generally Accepted Accounting Principles (GAAP). Time-series variation, driven by changes in GAAP, also affects the properties of accruals. Over the past twenty years, GAAP has significantly changed how firms recognize stock-based compensation costs (SFAS 123R), impair intangible assets (SFAS 141), and adjust the carrying value of financial assets and liabilities (SFAS 159). These (and other) changes to GAAP have shifted income recognition from that based on the "matching principle" (i.e., matching expenses to revenues; Paton and Littleton 1940) toward income recognition driven by balance sheet valuation changes.[1] This shift has affected the properties of the accrual component of earnings, yet, accounting researchers generally do not explicitly consider how heterogeneous accruals could affect inferences from reported tests.

The objective of our study is to examine how variation in GAAP measurement rules and reporting consistency impact the statistical properties of accruals and accrual-related inferences. To investigate our research question, we require a framework for analyzing the properties of accruals. The framework we adopt has been examined extensively in the literature and is based on the differential persistence of cash flow and accruals for earnings: Given two firms with the same level of profitability, the firm with the higher accruals tends to be less profitable in future periods (Sloan 1996). The relation between cash flows, accruals, and future profitability, often characterized by saying accruals are 'less persistent' or 'lower quality' than cash flows features

[1] See Basu and Waymire (2010) for a historical perspective on the influence of Sprouse (1966) on standard setting and Bromwich, Macve, Sunder (2010) for a discussion of flaws with the balance sheet perspective.

prominently in several streams of archival accounting literature including (i) the relation between accruals and future stock returns (Sloan 1996); (ii) reporting discretion (Dechow, Sloan, and Sweeney 1995); and (iii) earnings quality (Dechow and Dichev 2002; Dichev and Tang 2009).

Remarkably, despite significant interest in how economic fundamentals, reporting discretion and accrual estimation errors affect the persistence of the "accrual component of earnings" (Dechow, Ge, Schrand 2010; DeFond 2010), the empirical evidence is built from a surprisingly coarse set of accrual variables. The literature generally defines the accrual component of earnings as either the change in net working capital from the balance sheet (Dechow 1994; Sloan 1996) or as the difference between net income and operating cash flow (Hribar and Collins 2002).[2] The aggregate nature of these two accrual variables collapses accruals with diverse statistical, economic, and accounting rules into a single accrual variable, a choice that likely leads to specification problems in accrual models (Gerakos 2012; Ball 2013; Owens, Wu, Zimmerman 2017).

We suspect that differences in the types of accruals aggregated into the accrual component of earnings by researchers, what we refer to as accrual heterogeneity, significantly and predictably affects empirical inferences. In particular, the persistence of the aggregate accrual measure will reflect the weighted average of the persistence of the underlying heterogeneous accruals. If some of these underlying accruals are measured using GAAP measurement rules that focus on balance sheet revaluations, or reflect non-recurring business activities, then we expect the persistence of the aggregate accrual component of earnings will predictably and significantly differ from the persistence of the cash component of earnings.

To examine our research questions, we focus on an economically significant group of accruals. These accruals vary broadly in the GAAP measurement rules applied to recognize the

[2] In their review of the accrual literature, Larson, Sloan, and Zha Giedt (2018) suggest that while there are many variants of these two general accrual definitions, the variants vary little with respect to the Compustat data items used.

economic dynamics into earnings and in the consistency in which the same accrual is reported across firms. Examples of these accruals include bad debt expense, inventory provision charges, asset impairments, warranty reserves, and fair value adjustments. Firms report these accruals as reconciling line items in their statement of cash flows. However, because Compustat collects data for the full cross-section of publicly traded firms, it standardizes financial statement line items into a much smaller set of data items. The types of 'reconciling' accruals described above are aggregated together into the 'Funds from Operations-Other' (FOPO) data item in Compustat.

Using EDGAR, we extract financial statement line items reported by all publicly traded firms with Compustat fiscal years spanning 1995-2016. We identify over 100,000 different line items within the statement of cash flows that collectively map into the FOPO data item and then categorize these items into 32 accrual types.[3] The accruals aggregated into the FOPO data item relate to a broad range of business activities, spread across operating-, financial-, and equity-related activities. We find these accruals are economically and statistically significant, span a wide spectrum of GAAP measurement rules, and have increased in number and economic significance over our sample period. Further, there is an increasing set of firms reporting more than five FOPO accrual items—many of which offset each other when aggregated into FOPO, thus disguising important cross-sectional variation. With respect to the reporting consistency—which we define as a FOPO accrual reported in each of the past three years—we find significant diversity that includes: (i) consistently reported, balance sheet adjusting accruals with low reporting discretion (e.g., foreign currency adjustments); (ii) inconsistently reported balance sheet adjusting accruals with high reporting discretion (e.g., asset impairments); (iii) consistently reported accruals with low reporting discretion designed to match costs to current revenue (e.g., debt premium amortization); (iv) inconsistently reported accruals with high reporting discretion that attempt to match costs to current revenue (e.g., asset retirement obligations). In sum, we find that there is

[3] For more information on the data, please go to: sites.google.com/view/rjresutek/data

significant variation in the measurement rules and the reporting consistency of the accruals aggregated into FOPO. We expect that this variation will affect accrual inferences.

Our first set of multivariate tests examines whether variation in GAAP measurement rules explains differences between the earnings persistence slopes of cash flows and FOPO accruals for future earnings. We predict that GAAP measurement rules will impact the persistence of the different FOPO accrual items. As a baseline result, we find that relative to one dollar of cash flow, one dollar of FOPO accruals is associated with future earnings that are $0.60 lower. However, the individual components of FOPO have significantly different persistence coefficients and these slopes systematically vary by GAAP measurement rules. For example, GAAP measurement rules focused on balance sheet revaluation (e.g., foreign currency adjustments, fair-value accrual estimates, and asset write-downs) are much less persistent than the average FOPO accrual. In contrast, GAAP measurement rules focused on allocating costs over time (e.g., bad debt expense, stock-based compensation) are significantly more persistent than the average FOPO accrual.

Prior research suggests that accrual estimation error explains variation in the persistence of accrual components (e.g., Richardson et al 2005). Thus, an alternative explanation for the heterogeneity in FOPO accrual slope coefficients is that variation in GAAP measurement rules is correlated with variation in accrual estimation errors and that accrual estimation error drives the differing persistence. We address this concern in two ways. First, we note that many of the accruals aggregated into the FOPO data item are recurring in nature and allow managers almost zero reporting discretion, but have very low persistence (e.g., fair-value adjustments). These patterns align with our hypothesis that GAAP measurement rules, and not accrual estimation errors, explain some of the lower earnings persistence of accruals. Second, we develop a model that allows us to estimate the potential effects of estimation error on accrual persistence. Our results show that even high levels of assumed estimation error cannot explain the variation in the persistence of FOPO accruals. Collectively, these results support our contention that variation in GAAP measurement rules is an important explanation for variation in the persistence of the accrual component of earnings.

Our second set of multivariate test examines whether the consistency with which an accrual is reported, conditional on its GAAP measurement rules, explains earnings persistence. Theoretical research and executive surveys suggest that managerial reporting choices are important, yet archival study of questions in this area is limited by data availability. Because Compustat aggregates many different accruals into a single variable, within-firm variation of the consistency with which a firm reports different accruals cannot be examined. Results from our multivariate analysis support our assertion that reporting consistency plays an important role in understanding earnings persistence. First, we find that consistently reported FOPO accruals are more persistent. However, this pattern is not universal across all accrual types, but these differences are easily explained. Consistently reported accruals driven primarily by manager estimates of periodic costs or manager estimates of costs 'matched' against current revenue (e.g., bad debt expense, stock compensation expense) are significantly more persistent than other accruals. In contrast, consistently reported accruals driven primarily by measurement rules adopting a balance sheet perspective tend to have lower earnings persistence. As a final test, we show that our measure of reporting consistency can help archival researchers determine cross-firm differences in the accrual composition of the *ad-hoc* accruals labelled 'Other'. These accruals differ in persistence since firms choose which types of accruals to aggregate into these catch-all 'other' categories (e.g., one off unusual items versus recurring expenses). Our tests highlight the importance of reporting consistency, a firm-level reporting quality characteristic, in accrual quality tests.

Our study makes three contributions to the literature. First, our evidence suggests that accruals have lower earnings persistence for reasons other than accrual estimation errors (Dechow and Dichev 2002; Richardson et al. 2005), diminishing returns to investment (Fairfield, Whisnant, and Yohn 2003), or product-market dynamics (Lewellen and Resutek 2019). Our results highlight that accrual heterogeneity driven by the mixed attribute GAAP measurement model that governs how accrual earnings are estimated also impacts the persistence of accruals. The results also suggest that accurate inferences about accrual quality, particularly managerial estimation errors, require researchers to consider the composition of firms' accruals and GAAP measurement rules.[4]

Second, recent studies have begun to tackle the question of whether time-series changes in earnings quality are driven by changes in economics or accounting standards (Srivastava 2014; Bushman et al. 2016). Other studies conjecture, but do not test, that reporting consistency is an important attribute of earnings quality (Dichev et al. 2013). We contribute to these studies by providing evidence that there is significant variation in the types of accruals reported by firms, both cross-sectionally and over time. Collectively, our results suggest that accrual composition changes are associated with the decline in earnings quality as conventionally measured. In addition, our granular data allows us to investigate the impact of reporting consistency on earnings quality. We show that reporting consistency is a separate earnings quality property, distinct from an accrual's time-series properties (auto-correlation and earnings persistence).

Finally, our study contributes significant new data and perspective in a topical area that spans a broad array of questions in accounting research. Managerial reporting choices vary—often significantly—across firms and over time. Theoretical research and executive surveys suggest that variation in managerial reporting choices is important, yet archival study in this area is limited by data availability. Our evidence on reporting consistency offers a new perspective on an attribute of earnings quality previously unexamined by the academic literature.

[4] Our general inference builds on and is similar in tenor to Lawrence, Sloan, and Sun (2013) who highlight that neutral application of GAAP by managers explain many empirical patterns prior studies attribute to discretionary conservative reporting choices of managers due to contracting incentives.

II. MOTIVATION AND PREDICTIONS

The objective of our study is to better understand how the aggregation of accruals with different measurement rules and different reporting consistencies affect the empirical inferences related to those accruals. We focus our study on a key empirical pattern underlying many accrual quality measures and studies: the accrual component of current earnings persists less strongly into future earnings than the cash component.[5] This empirical pattern is built on a cross-sectional research design where cash and accrual components of current earnings are used to predict future earnings. Formally:

$$NI_{i,t+1} = b_0 + b_1 CF_{i,t} + b_2 Acc_{i,t} + e_{i,t+1} \quad \textbf{(1)}$$

where NI represents some form of earnings, CF represents the cash component of NI, Acc captures the accrual component of NI with an underlying assumption that NI = CF + Acc and each variable is cross-sectionally demeaned, usually by average assets. The key empirical regularity from this regression framework is that b_2 is less than b_1. While studies offer multiple explanations for this pattern, the different explanations converge into two general groups.

Perhaps the most prominent group centers on an explanation first offered by Sloan (1996). Sloan highlights how the accrual component of earnings requires managers to make many different subjective estimates. Examples of these estimates include provisions for uncollectible receivables, asset impairments, warranty reserves, stock-based compensation, and many others. These accrual estimates, invariably, contain errors. A key insight by Sloan is that these accrual estimation errors, whether intentional or unintentional, cause reported accruals to deviate from 'true' or perfectly measured accruals, leading to stock mispricing (Sloan 1996; Richardson et al. 2005), lower earnings quality (Dechow and Dichev 2002), and higher costs of capital (Francis et al. 2004).

[5] There are many other approaches that we could adopt to analyze accrual quality. Nezlobin, Sloan, and Zha Geidt (2019) provide a comprehensive theoretical and empirical analysis of many accrual quality metrics and their results suggest that the differential persistence approach that we adopt is the best specified of all the approaches.

The second group of explanations suggests that accruals covary with underlying economic fundamentals that are correlated with lower profitability (Thomas and Zhang 2002; Fairfield et al. 2003; Lewellen and Resutek 2019). While the economic mechanisms differ across studies, explanations in this group differ from Sloan's estimation error explanation by suggesting that lower future profitability is correlated with, not caused by, accruals.

The impact of GAAP measurement rules on accrual persistence

We posit and test a third explanation: GAAP measurement rules for recording accruals explains variation in accrual persistence. This explanation derives from the simple observation that existing GAAP income measurement aggregates accruals with different measurement rules into earnings. These measurement rules span a broad continuum. At one end are measurement rules that adjust balance sheet values to fair market values. Accruals that adjust the carrying value of assets and liabilities to 'fair market value' should have zero earnings persistence as market prices follow a random walk and changes in prices that represent fair-value accruals should be independent and identically distributed. At the other end of the GAAP measurement rule continuum are accruals that perform more of a 'matching' role and seek to recognize expenses against revenue in the periods generated (e.g., bad debt expense). Such accruals are expected to be more persistent since they likely strongly covary with sales levels that are very persistent.

To date, the empirical accrual literature examining current operating accruals has largely either combined all FOPO accruals with working capital accruals (Hribar and Collins 2002) or excluded FOPO and examined working capital accruals (Dechow and Dichev 2002). Both variable definitions are problematic. Combining FOPO accruals with working capital accruals produces an operating accrual variable containing a significant set of accruals related to non-current assets, financial assets, and common stock. Thus, any inference drawn on these accrual variables is confounded: is the predictive relation due to operating accruals or other, non-operating accruals contained in FOPO? On the other hand, excluding FOPO entirely from an operating accruals definition removes many accruals, such as bad debt expense, warranty reserves, and inventory adjustments, that theory (and general intuition) suggests contribute significantly to the quality of a firm's operating accruals. These issues cannot be addressed with Compustat data and affect a large set of accruals studies.[6] These facts motivate our tests and lead to our first prediction:

P1: The persistence of accruals systematically varies with GAAP measurement rules. Accruals that revalue the balance sheet will be less persistent than accruals that allocate (to match) periodic costs to periodic revenues.

Note that P1 does not require estimation error or variation in economic fundamentals to explain variation in the persistence of accruals. Instead, we expect GAAP measurement rules to differentially affect persistence coefficients absent estimation error (Sloan 1996; Richardson et al. 2005), diminishing investment returns (Fairfield et al. 2003), or product market shocks (Lewellen and Resutek 2019).

The impact of managerial discretion and estimation error on accrual persistence

As noted above, Compustat aggregates accruals spanning a wide spectrum of GAAP measurement rules into the FOPO data item. This attribute of the FOPO data item makes it a natural choice to test our hypothesis linking variation in GAAP measurement rules with variation in earnings persistence. As Lewellen and Resutek (2016) note, however, there is significant reporting discretion in many of the accruals aggregated into FOPO. This reporting discretion is linked to an important concern that we consider: variation in accrual estimation error, which prior studies suggest reduces earnings persistence, could explain our results. That is, the differences in the observed persistence slopes of accruals that we attribute to differences in GAAP measurement rules could be due to differences in accrual estimation error. We address this concern in two ways.

[6] Larson, Sloan and Zha-Geidt (2018) offer a comprehensive review of contemporary accrual studies and the variables used in these studies. Although variation in the empirical accrual definitions exists, all of the accrual definitions have the potential of reducing the power of tests and biasing inferences.

First, although FOPO contains many accruals subject to substantial reporting discretion, a large set of FOPO accruals have almost no reporting discretion. For example, FOPO contains accruals that are driven by changes in market values with no reporting discretion (e.g., Level 1 fair value accruals of trading assets) and balance sheet revaluation accruals with significant management discretion (e.g., goodwill impairments). Variation in the reporting discretion tied to accruals centered on the matching principle also exists. FOPO contains accrual expenses relating to bad debt allowances and stock-options which are subject to considerable discretion and accruals related to debt premium amortization which allow very little reporting discretion. By examining how variation in GAAP measurement rules correlates with variation in the persistence of accruals, we can offer some assurance that the differential earnings persistence we note related to FOPO accruals cannot completely be explained by accrual estimation error.

Second, we extend the estimation error model of Lewellen and Resutek (2019) and test estimation error's effect on accrual persistence coefficients. Our model allows us to quantify the effect that estimation error would have on the differential earnings persistence of the cash- and accrual component of earnings. If differences in earnings persistence slopes cannot be explained by assumed levels of estimation error, then this adds support for our hypothesis that GAAP measurement rules are an important driver of an accrual's persistence.

Consistent with Lewellen and Resutek (2019) and Richardson et al (2005), our model builds on the standard earnings persistence regression framework (see Eq. 1). We assume observed accruals, Acc, do not equal 'true' (or perfectly measured) accruals, Acc^*, due to manager errors, η_t, in estimating accruals; i.e., $Acc_t = Acc^*_t + \eta_t$. We allow η_t to be serially correlated over time but assume it is uncorrelated with CF_t and Acc^*_t.[7] In Appendix 1 we show that b_1, the

[7] We assume estimation errors to be unintentional; thus, the estimation errors are assumed to be uncorrelated with CF and Acc^*. In unreported analysis, we relax this assumption (i.e., estimation errors are correlated with CF). We assume various levels of both negative and positive correlation and find that the impact of estimation error remains small relative to the magnitude of reported persistence coefficients for most FOPO accrual types.

persistence slope on cash flow, and b_2, the persistence slope on accruals, can be expressed as follows:

$$b_1 = \frac{\gamma\sigma^2_{CF}\sigma^2_{Acc} - \sigma_{CF,Acc}\left(\phi\sigma^2_{Acc} + \sigma^2_{\eta}(\lambda - \phi)\right)}{\sigma^2_{CF}\sigma^2_{Acc}\left(1 - \rho^2_{CF,Acc}\right)} \quad \textbf{(2)}$$

$$b_2 = \frac{\phi\sigma^2_{Acc} + \sigma^2_{\eta}(\lambda - \phi) - \gamma\sigma_{CF,Acc}}{\sigma^2_{Acc}\left(1 - \rho^2_{CF,Acc}\right)} \quad \textbf{(3)}$$

where γ, ϕ, and λ represent the univariate slopes on cash flow (CF), true accruals (Acc^*), and accrual errors (η) for future net income, and $\sigma^2_{(\cdot)}$, $\sigma_{(\cdot)}$, $\rho_{(\cdot)}$ are the variances, covariances, and correlations of the variables. Several points are worth noting. First, absent estimation error in accruals ($\sigma^2_{\eta} = 0$), b_2 can be different from b_1. This feature relaxes the assumption in Lewellen and Resutek's estimation error model that $b_1 = b_2$ in settings with zero estimation error. Indeed, we expect $b_1 \neq b_2$ in many settings due to GAAP's mixed attribute measurement model. Second, if estimation error exists, quantifying its effect on b_2 is difficult as the time-series properties of estimation error (λ and σ^2_{η}) are not directly observed.

Despite the fact that ϕ, λ and σ^2_{η} cannot be explicitly observed, Appendix 1 shows how the economic significance of estimation error on earnings persistence slopes can be inferred by assuming estimation error parameters. Key to this parameterization exercise is an understanding of λ and σ^2_{η}. While σ^2_{η} simply captures the economic magnitude of the estimation errors cross-sectionally, the effect of λ is more subtle. A simple way to think about λ is to consider how accrual estimation errors affect the balance sheet. For example, underestimates in bad debt expense lead to inflated book equity. While errors in reported book equity levels may repeat, due to intentional or unintentional reporting errors, these errors should be temporary due to subsequent period collections of A/R, audit pressure, etc. If so, estimation error in the *level of* book equity (ε) can be modeled as following a mean-reverting process, e.g., $\varepsilon_{t+1} = \varphi_{\varepsilon}\,\varepsilon_t$, where $\varphi_{\varepsilon} \geq 0$. Estimation error in the change of book equity—i.e., earnings—can therefore be expressed as the year-over-year change, i.e., $\eta_t = \varepsilon_t - \varepsilon_{t-1}$, yielding an autocorrelation for estimation error in earnings, $\lambda = -(1-\varphi_\varepsilon)/2$. In words, if estimation error in book equity is completely transitory ($\varphi_\varepsilon = 0$), estimation error in bad debt expense is expected to reverse in the subsequent period with $\lambda = -\frac{1}{2}$.[8]

Using the slope derivations for b_1 and b_2, parameterized by variances, covariances, and correlations from the observed data combined with assumed values for σ^2_η and λ, we can estimate what the slopes on cash flow and accruals *would be* if unobserved estimation error with the assumed properties were removed. The adjusted slopes on cash flow and accruals, which we denote b_1^{adj} and b_2^{adj}, can be interpreted as the 'true' slopes on CF and Acc from Eq. (1) absent estimation error. By comparing the adjusted coefficients to the regression slopes derived from the observed data, we can quantify how significant estimation error would need to be to explain variation in the persistence slopes.[9]

Quantification of the effect of accrual estimation error on earnings persistence slopes is important. Ball (2013) whimsically chides accounting researchers for the widely held belief that "earnings management is rife." Ball's criticism largely centers on accrual models that Ball suggests have implausible levels of earnings management. Ball's criticism suggests that researchers go beyond showing an empirical pattern that is consistent with earnings management (e.g., a lower persistence coefficient on the accrual component) and also show readers that the implied level of earnings management is plausible given the controls built into the financial reporting system (e.g., external auditors, internal auditors, audit committees, etc.). Our model, while not a panacea that perfectly captures all the dynamics of accrual accounting, provides a framework that ties quantitative values that describe accrual estimation error to observed empirical relations.

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[8] Dechow et. al (2012) show that modelling accrual reversals in this manner improves the specification and power of discretionary accrual models.

[9] An interesting, and overlooked, statistical property of accrual estimation error is that to the extent a nonzero covariance exists between Acc^* and CF ($\sigma_{CF, Acc^*} \neq 0$), the persistence of CF is affected by estimation error. A common assumption in the accrual literature is that estimation error does not affect the predictive slope of CF for future earnings. Eq. (2) highlights that this assumption is incorrect.

P2: Variation in the persistence of FOPO accrual components is due to accrual estimation error.

P2 (null): Variation in the persistence of FOPO accrual components is not due to accrual estimation error.

P2 predicts that the lower persistence of the accrual component of earnings relative to the cash component is solely driven by estimation error. Thus, *P2* predicts that if plausible levels of accrual estimation error are removed, the coefficient on accruals will be indistinguishable from the coefficient on cash flow, $b_1^{adj} = b_2^{adj}$. In contrast, under the null hypothesis, estimation error will not explain variation in the coefficient on accruals because other factors (in our case, GAAP measurement rules) influence the slope coefficient, so $b_1^{adj} \neq b_2^{adj}$. Thus, not rejecting *P2 (null)* provides corroborating evidence in support of *P1* since it rules out the competing explanation that accrual estimation error explains the lower persistence of accruals.

The impact of reporting consistency on accrual quality

The second part of our analysis examines how reporting consistency affects earnings persistence. We define "consistency" as a FOPO accrual line item that is reported for at least three consecutive years.[10] Our reporting consistency measure is a binary variable equal to 1 if the firm reported the same line item in each of the prior three years, and 0 otherwise.[11] Standard setters and survey evidence both suggest that reporting consistency is an important attribute of earning quality (Dichev et al. 2013). However, to date, large sample evidence on this reporting attribute is largely nonexistent due to data limitations. The unique granularity of our dataset allows us to examine reporting consistency from a new angle.

We expect that reporting consistency will affect an accrual's earnings persistence and this effect is a function of GAAP measurement rules, firm economics, and how managers choose to

[10] Our choice of at least three consecutive years is not critical and inferences using a two year window are unchanged. The three year window is consistent with Compustat's approach to classifying items as recurring or special. Compustat no longer classifies an item as a special item once the item is reported for at least 3 years.

[11] Peterson et al. (2015), operationalize consistency by how linguistically similar firm-level 10K footnotes are from year-to-year with respect to the words used and the linguistic tone. Our measure of reporting consistency complements other alternative approaches but we view our measure as simpler to understand and implement.

label accrual choices. The latter dynamic we loosely refer to as the managerial intent behind the accrual. On an unconditional basis, we expect that reporting consistency is unrelated (or weakly positively related) to the persistence of individual accrual items. This expectation is linked to GAAP measurement rules. We expect accruals that adjust assets and liabilities to 'fair-values' based on movements in market prices to be consistently reported, but have very low persistence. In contrast, we expect consistently reported accruals tied to measurement rules that allocate costs to the period in which revenue is recognized (bad debt expense or inventory provisions) to be more strongly associated with earnings persistence.

Conditional on the accrual type, however, we expect that the more consistently a firm reports an accrual, the more likely it relates to a recurring business activity that is likely to persist in the future. This expectation is centered on the idea of how variation in the managerial intent of the underlying accruals could also vary even when accruals are similarly or identically labeled. A simple example illustrates our intuition for this prediction. Assume Firm A consistently reports a provision for obsolete inventory. That is, a charge is recognized each period that reduces the carrying value of Firm A's inventory for normal spoilage. Assume Firm B also records a provision for obsolete inventory, and labels it in the exact same way as Firm A, but the intent of the inventory provision accrual is similar to that of a write-down. Our measure of reporting consistency allows researchers to distinguish Firm A from Firm B. This reasoning also applies to the more ad hoc 'Other' label that hides the underlying nature of an accrual. Some firms may aggregate recurring, but individually insignificant accruals into a reconciling item on the statement of cash flows labeled 'Other'. In contrast, some firms may lump disparate transitory items into a catchall line item labeled 'Other'. Our measure of reporting consistency allows us to empirically capture, to some extent, the managerial intent of an accrual.

P3: Ceteris paribus, consistently reported accruals have higher earnings persistence relative to accruals of the same type that are not reported consistently.

III. DATA AND DESCRIPTIVE RESULTS

Table 1 is a summary of our selection process. Our 'Full' sample spans all firms in the CRSP/Compustat merged file with fiscal years ending between June 1995 and May 2017. From this sample, we drop firms that are not publicly traded and firms missing valid data items for earnings before extraordinary items, nontransaction, and working capital accruals per the statement of cash flows in year t. Consistent with the convention in the accrual literature, we exclude financial firms. Our full sample yields 85,117 firm years.

We match each Compustat firm-year observation from our full sample to its corresponding annual SEC report (10K) using CIKs and annual report dates (Compustat data item *datadate* and SEC conform dates). To identify the correct table within the annual filing, we test whether the table contains line items equaling the values reported in Compustat for cash flows from operating, investing, and financing activities (OANCF, IVNCF, FINCF).[12] If the line items in the table match the aggregate cash flow values reported in Compustat, we consider this table to be the statement of cash flows.

Next, we match these cash flow line items to the Compustat data items relating to the statement of cash flows. We first attempt a one-to-one match between the line item reported in the 10K to the data items reported in Compustat. The remaining line items are then matched to Compustat data items through algorithmic iterative matching techniques. We use several methods to complete our FOPO line item mapping with a key attribute being that we have perfectly mapped all line items within the CFO section of the 10K to data items reported by Compustat for all firm-years used in our sample. Our mapping process yields 67,944 unique firm-years 9,599 unique firms, averaging 3,088 firms per year.

[Table 1 here]

[12] To keep the explanation concise, we omit many of the technical details. The technical details of the data mapping process are available upon request.

Cross-sectional descriptive statistics

Table 2 reports descriptive statistics for the primary Compustat variables we examine. We sign each accounting variable based on its effect on earnings (e.g., we sign depreciation negatively because it reduces earnings). Empirical patterns noted in Panels A and B closely mirror summary statistics reported in prior studies, but a few patterns are worth noting. First, working capital accruals have lower cross-sectional volatility (0.072) than FOPO (0.081). Second, FOPO is comprised primarily, but not exclusively, of expense components (FOPO averages -0.037 over the sample period). While items such as write-downs, stock compensation expense, and provisions tend to reduce earnings, the 99th percentile value of 0.069 suggests that positive earnings items such as fair-value adjustments, bargain purchase accruals, and other 'gain' related accrual components are non-trivial. Third, the annual autocorrelation of FOPO (AR_1) is positive (0.325) and higher than working capital accruals (0.114), suggesting that FOPO accruals are not completely transitory.

Panel B reports correlations. FOPO has a strong positive relation with current earnings (0.57), consistent with many items in FOPO having a dollar-for-dollar impact on earnings. In contrast, the relations between FOPO and cash flow (0.27), depreciation (0.11) and working capital (-0.02) are much weaker, patterns suggestive that the information conveyed by FOPO is distinct from other earnings and cash flow components.[13]

[Table 2 here]

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[13] Some readers have inquired about the overlap between the components of FOPO and Compustat 'Special Items.' Interestingly, we find minimal correlation between these components even for those where significant overlap might be expected. For example, Compustat does not record a goodwill impairment or asset write-down in 'Special Items' in 64 percent of cases where a company records an asset write-down line item in its statement of cash flows.

Table 3 provides descriptive statistics for the 32 accrual components included in the FOPO data item. We provide cross-sectional averages of selected summary statistics. To ease discussion, we organize the accruals into three subsets based on business activity (Operating, Financial, and Shareholders' Equity) and into subgroups based on functional similarity (e.g., current versus noncurrent). We use the term FOPO* as a generic label for the 32 individual accrual components.

Table 3 highlights several notable patterns. First, firms do not report most FOPO accrual components in any given year. While our primary sample averages 3,088 firms per year, most FOPO accrual components are reported by fewer than 300 firms in any given year. The accruals aggregated into FOPO that firms do report, however, are significant with most having an average negative earnings charge of close to 1.0 percent of assets. Further, statistically speaking, the cross-sectional volatilities of these accruals are large, often more than 3.0 percent of assets and spanning both negative and positive earnings charges.

Second, Table 3 suggests that the accruals aggregated into the FOPO data item are driven by a wide variety of GAAP measurement rules. For example, Table 3 notes that a nontrivial number of fair-value accrual adjustments related to financial assets and liabilities are aggregated into FOPO. Although these 'fair-value' accruals are driven by measurement rules that seek to adjust balance sheet carrying values, these accruals are governed by a very different set of measurement rules than those associated with asset impairment accruals. These 'balance sheet' oriented accruals, in turn, differ from those associated with debt premium amortization, stock-based compensation, and bad debt expense, accruals largely governed by the 'matching' principle which seeks to match periodic costs to current revenues. Table 3 confirms that the accruals aggregated into FOPO are heterogeneous, with an assortment of measurement rules.

Third, the descriptive statistics provide useful insight for studies examining links between reporting discretion and accrual estimation error. Many studies over the past 20 years focus on the negative impact that reporting discretion has on earnings quality (Dechow et al. 2010 and DeFond 2010). Statistical inferences that support these claims are almost universally based on reporting discretion models that, at best, estimate reporting discretion indirectly. Table 3, while offering simple cross-sectional statistics, provides a new perspective on the economic significance of the accruals that managers are hypothesized to manage. For example, our results suggest that an AR provision charge that is one standard deviation from the mean moves reported earnings by 1.7%, for approximately 1,028 firms per year that explicitly report these accruals. On the other hand, warranty reserves are rarely reported on the statement of cash flows (an average of 18 firms per year), a fact that suggests warranty reserves are not an economically significant accrual for most firms. These facts, as simple as they are, provide important economic context to studies examining reporting discretion.

[Table 3 here]

Time-series descriptive properties of FOPO

We next explore time-series variation in the composition of FOPO. Figure 1 plots for each year, the number of accrual components aggregated into FOPO for select percentiles. In 1995, the typical firm reports slightly less than two accrual line items that Compustat aggregates into FOPO; by 2016 Compustat is aggregating almost four different accruals into FOPO. Perhaps more interesting is the number of line items at the upper end of the line item distribution. In 1995, firms in the 99th percentile reported five different line items. By 2016, this number increased to 10 while firms above the 99th percentile are reporting as many as 16 line items (untabulated).

Figure 2 plots the difference between the absolute value of FOPO (|FOPO|) and the sum of the absolute value of the components of FOPO ($\Sigma|FOPO^*|$), where $FOPO^*$ are the 32 accrual components of FOPO. The difference between these two values quantifies how FOPO components of differing signs offset each other when Compustat aggregates them together. Not surprisingly, there is no difference in the lowest 10th percentile as |FOPO| exactly equals Σ|FOPO*|. The more interesting patterns are in the higher percentiles. For example, the average difference increases from 0.2 percent of assets in 1995 to 1.1 percent of assets in 2016. At the higher end, the difference is even more extreme. The 90th percentile increases from less than 0.4 percent of assets to almost 2.5 percent by 2016 while the 99th percentile difference (not tabulated) is an economically significant 17.5 percent.

[Figures 1 and 2 here]

Figures 3a and 3b explore how the composition of FOPO changes over the sample period. We aggregate the 32 FOPO components into five subgroups (current operating, non-current operating, other operating, financial, and shareholder's equity accruals). The figures plot these FOPO sub-groups on equal- and value-weighted bases. The equal-weighted basis approach provides perspective on the time-series variation for the five FOPO subgroups as a percent of assets. In contrast, the value-weighted basis provides insight on which FOPO accrual groups have the greatest dollar value impact on FOPO across publicly traded firms.

Several patterns offer new insights to the accounting literature. First, on both an equal-weighted and value-weighted basis, the figures show that FOPO is not disproportionately comprised of a single accrual type. Second, write-downs (and other non-current operating accruals) comprise the largest percentage of FOPO in the value-weighted plots but a much smaller percentage on an equal-weighted percentage. These patterns suggest that significant write-downs exist in all years (not just recessionary years), but are concentrated in a small set of large firms. Third, stock-based compensation constitutes more than 50 percent of FOPO on an equal-weighted basis toward the end of the sample, but a much smaller percentage on a value-weighted basis. These patterns suggest that a high percentage of firms report stock-based compensation charges (hence, the relatively high equal-weighted composition in 2016), but aggregate stock-based compensation is less than aggregate $FOPO^*$ components related to noncurrent operating accruals.

[Figure 3 here]

In sum, Table 3 and Figures 1 through 3 suggest FOPO is comprised of a disparate group of accruals. Significant variation exists both across and within the FOPO accruals in the cross-section and time-series. Of particular note, Table 3 suggests significant variation in GAAP measurement rules exists, variation that likely affects the statistical qualities of aggregated accruals such as FOPO. The changing variation likely plays an important role in the declining quality of earnings documented by previous research (e.g., Srivastava 2014; Bushman et al. 2016). In the next section, we examine the effect of this heterogeneity on differences in the persistence of the cash- and accrual-components of earnings.

IV. EMPIRICAL TESTS

The persistence of FOPO components

Table 4 provides our multivariate analysis that focuses on the slopes from annual cross-sectional regressions (Fama and MacBeth 1973) of future earnings on the components of current earnings. The goal of these regressions is to understand whether the accrual components of FOPO have persistence slope coefficients that significantly differ from those of cash flow (or other accrual components). We group $FOPO^*$ accruals along two distinct dimensions. Panel A groups $FOPO^*$ accruals by business activity/economic function: operating-, financial, and equity-subgroups ($FOPO^G$), while Panel B groups $FOPO^*$ accruals by GAAP measurement principles.

The first model in each panel of Table 4 (shaded and labeled "All") establishes the baseline relation and reports the earnings persistence of the aggregate FOPO data item:

$$NI_{t+1} = a_0 + a_1\, CFO_t + a_2\, FOPO^G_t + a_3\, OthAcc^*_t + a_4\, Dep_t + a_5\, dWC_t + e_{t+1} \quad (4)$$

Consistent with Lewellen and Resutek (2016), nontransaction accrual components ($FOPO^G$ = 0.333 and $OthAcc^*$ = 0.369) are significantly less persistent than cash flow (0.933) and working capital accruals (0.724). A common interpretation of a lower coefficient on an accrual component is that accruals contains more estimation error. However, if Compustat aggregates accruals with different GAAP measurement rules into the FOPO data item, then the differential persistence slopes on the FOPO accruals could be driven by accrual heterogeneity. We examine this possibility in the subsequent columns of Panel A and B of Table 4.

In Panel A of Table 4, models (2) through (8) estimate the earnings persistence of different $FOPO^G$ accruals organized by economic activity. If the different groupings capture the same predictive qualities, then slopes on the various $FOPO^G$ variables across columns should equal the $FOPO^G$ slope in Model (1). This is not the case. In panel A, the slopes on $FOPO^G$ vary from a low of 0.226 (model 3) for noncurrent operating accruals to 0.987 for $FOPO^G$ accruals related to shareholders' equity (model 8). Interestingly, $FOPO^G$ accruals related to bad debt and inventory provisions (model 2) and stock-based compensation (models 7 and 8) have the highest persistence slopes. These accruals are often conjectured to be driving the lower persistence of the accrual component of earnings due to the significant discretion managers have when making these accrual estimates. Nonetheless, these accruals are more persistent than the financial accruals, which prior studies suggest contain little to no estimation error (Richardson et al. 2005).

Panel B of Table 4 provides results for GAAP measurement groupings in columns (2) through (6). In this panel, we subdivide operating and financing $FOPO^*$ accruals into $FOPO^G$ groups based on whether GAAP rules are: (i) allocating costs over time or to periods in which revenue is recognized ('Matching'); (ii) asymmetric gain/loss recognition consistent with the accounting conservatism ('Conservatism'); (iii) applying balance sheet revaluations based on fair-value principles ('Fair Value'); and (iv) ambiguous and do not fit neatly into the above categories ('Mixed').

The results indicate that $FOPO^G$ accruals governed by the matching principle (Models 2 and 4) have higher earnings persistence relative to GAAP rules that focus on the balance sheet (Models 3 and 5). Results for Model 2 suggest that operating accruals governed by the matching principle are the most highly persistent group (0.899, t-statistic 11.50) and indistinguishable from cash flow. In contrast, but consistent with the principles of fair-value accounting where changes in value are unpredictable, the earnings persistence of fair-value financial accruals are indistinguishable from zero (0.224, t-statistic 1.41). These results are in line with our earlier discussion that even though accrual estimation error tied to reporting discretion leads to lower accrual persistence, accounting rules can play a similar role.

In sum, Table 4 highlights significant variation in the persistence of $FOPO^G$ accruals. This variation is consistent with our hypothesis that different GAAP measurement rules predictably affect the persistence of accruals. This said, the empirical patterns may also be due to (unobserved) estimation error in these $FOPO^G$ accruals. We examine the plausibility of the alternative explanation in Tables 5 and 6.

[Table 4 here]

Table 5 examines at the accrual component level, the power of FOPO to predict future earnings. The setup of the regression analysis in Table 5 mirrors those in Table 4 with one small twist. Due to the fact that firms do not report most FOPO components in any given year, accrual items are sparsely populated across firms and years. To preserve the integrity of the variation in the FOPO components, we winsorize each component annually using only firm-years with non-missing values. This reduces the impact that extreme observations have on the FOPO component's variation within only the firms that report that component. We then set non-reported FOPO components values to zero. This design choice allows us to directly compare slopes across FOPO components since the sample is the same across all specifications. The added advantage is that the slopes on CFO, Dep, and dWC will be approximately the same across each of the regression specifications. Finally, to ensure our inferences apply to the broad sample (and are not driven by a small subset of firms) we only report results for FOPO components with at least 25 valid observations in at least 5 years. Colum (1) of Table 5 reports the average coefficient for each FOPO* component from the earnings persistence regression, while columns (3), (4), and (5) test whether the slope is significantly different from OthAcc*, CFO, and dWC.

Several noteworthy patterns emerge from Table 5. First, consistent with *P1*, the persistence slopes on FOPO* components vary widely. Consistent with the intuition concerning GAAP rules provided in Panel B, Table 4, operating accruals relating to AR provisions (0.785) and non-stock compensation (0.835) are significant with persistence slopes that are significantly higher than OthAcc* (t-statistic of 3.85 and 5.09, respectively) and insignificantly different to the CFO coefficient. In contrast, accruals related to fair-value adjustments to balance sheet items have relatively low persistence that is often indistinguishable from zero.

Second, the relative magnitudes of the FOPO* persistence slopes are consistent with *P1*, suggesting that variation in the GAAP measurement rules explains variation in the earnings persistence slopes. As mentioned above, accounting rules that are driven by matching tend to result in accruals with high persistence whereas fair value rules induce accruals with low persistence. While the low persistence of fair value accruals is expected based on the measurement rules that govern these accruals, the consensus in the accrual literature is that financial accruals are some of the most reliably measured accruals and therefore should have high earnings persistence. Clearly, this logic does not apply to all "reliably measured" financial accruals. In a similar vein, the persistence of accruals relating to the amortization of debt issuance costs is relatively high (0.504) but significantly lower than cash flow despite these accruals affording managers very little reporting discretion. These results provide support for our conjecture that variation in GAAP measurement rules explain variation in accrual persistence (*P1)* and some preliminary support for

P2 as these accruals have low persistence despite offering (almost) no managerial reporting discretion. We more formally examine *P2* in Section 4.2.

Finally, note that there is significant variation in the 'other' $FOPO^*$ accrual coefficients such as OthAst (0.542), OthProv (0.280), and Other (-0.229). This may be due to heterogeneity in the underlying items in these categories. Some firms report these line items each year, likely aggregating a set of routine accruals related to recurring business activities together into a line item often labeled 'Other'. Other firms report such accruals on a much more sporadic basis likely due to the transitory nature of the underlying business event. Thus, variation in the reporting consistency of these 'other' accruals likely explains why predictive qualities differ when analyzed in a simple cross-sectional setting. We explore this explanation in more detail in Section 4.3.

[Table 5 here]

The impact of estimation error on the persistence of FOPO accruals

Table 6 formally tests the role of estimation error on variation in the persistence of FOPO accruals. The structure of Table 6 is similar to Table 4. Panel A reports our analysis of the potential effect of estimation error on the earnings persistence of $FOPO^G$ accruals grouped by business activity, and Panel B reports a similar analysis for $FOPO^G$ accruals grouped by GAAP measurement principle. For comparative purposes, the top part of each panel reports the slope estimates on the $FOPO^G$ accruals as reported in Table 4. The bottom part of each panel reports slopes for $FOPO^{GAdj}$, which represent estimates of the $FOPO^G$ coefficients after removing assumed levels of estimation error. Since estimation error results in future accrual reversals that impact future earnings (makes earnings less persistent), a general consequence of removing estimation error is an increase in the accrual coefficient. *P2* predicts that after adjusting $FOPO^G$ for presumed levels of accrual estimation error, the 'cleaned-up' or 'true' $FOPO^{GAdj}$ slope estimates will insignificantly differ from cash flow coefficient estimates. In contrast, if GAAP measurement rules play a role, the slope estimates on $FOPO^{GAdj}$ will remain significantly different (i.e., not reject *P2 (null)*).

As noted in Section 2, the statistical properties of estimation error are not observable to the researcher. To infer the effect that estimation error has on the regression slopes, we perform the following analysis. Each year, we regress $FOPO_t^G$ and CFO_t on $OthAcc_t^*$, Dep_t, and dWC_t. Residuals from these annual regressions represent the cash- and accrual-components of earnings defined in Section 2 (Eq. 1) that are orthogonal to other contemporaneous accruals. Using sample annual variances, covariances, correlations, and univariate slopes for these residual-based variables along with parameters that assume estimation error completely reverses within one year ($\lambda = -½$) and that estimation error comprises 5% of total $FOPO^G$ volatility ($\sigma^2_\eta = \theta \cdot \sigma^2_{FOPO_G}$, where $\theta = 5\%$), we can infer the univariate slope on 'true' accruals for net income (ϕ). Once we recover ϕ, we can form estimates for the earnings persistence slopes on cash flow and accruals, b_1^{adj} and b_2^{adj}. These values are estimates of the 'true' earnings persistence slopes on CF and Acc when the effects of estimation error are removed.

The top half of panel A of Table 6 reports the earnings persistence slopes on CFO and $FOPO^G$ from Table 4. For each of the operating- and financing- $FOPO^G$ groups in Panel A, the slope on $FOPO^G$ is significantly lower than the slope on cash flows, a pattern prior studies suggest is due to poor accrual quality driven by the reversing effects of estimation error. The bottom half of Panel A reports the slopes for $FOPO^{GAdj}$. These are the slopes on $FOPO^G$ when we remove our assumed levels of estimation error. Two important patterns emerge from the results. First, the coefficients on $FOPO^{GAdj}$ are only modestly higher than those on $FOPO^G$. To contextualize the magnitude of the difference, consider the persistence slope of 0.423 on $FOPO^{GAdj}$ in the first (shaded) column compared to the coefficient of 0.333 on its unadjusted counterpart $FOPO^G$. Assuming estimation error comprises 5% of the variance of $FOPO^G$ (after adjusting for the joint-correlations with Dep, $OthAcc^*$, and dWC), the implied cross-sectional standard deviation in estimation error (σ_η) in our sample is economically significant, and largely implausible, 0.018.[14] Such levels imply reported earnings for 20-25% of firms deviate from 'true' earnings by more than two percent of assets, or forty percent of reported EPS.[15] Even if such levels were assumed plausible, and the errors completely reversed in one year, the effect on the $FOPO^G$ earnings persistence slope is modest and slopes remain significantly different from that of cash flows ($CFO^{Adj} – FOPO^{GAdj} = 0.501$, t-statistic of 19.46).[16]

Panel B of Table 6 provides our analysis of $FOPO^*$ accrual groups based on GAAP measurement rules. We find that for conservative accruals (Model 3) and fair value accruals (Model 5), even after adjusting for high levels of estimation error, the accrual coefficients do not vary much from their unadjusted counterparts and the impact is not sufficient to result in the coefficient being of equal magnitude to that on the cash component. In contrast, we find that the earnings persistence of operating accruals tied to the matching principle (model 2) is insignificantly different from the persistence of cash flows (0.006, t-stat =0.07). Interestingly, our estimation error adjustment for this set of accruals yields an adjusted slope of 1.108, a level that is actually modestly higher than cash flow. The collective interpretation of the relative magnitudes of the slopes on $FOPO^G$ and CFO in model 2 in panel B is that if estimation error exists in $FOPO^G$, its economic significance is minimal and is much less than the λ and σ^2_η we assume.

[Table 6]

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[14] In our sample, after removing variation in $FOPO^G$ explained by Dep, dWC, and $OthAcc^*$, the residual annual variance is roughly 0.0055, yielding a standard deviation of approximately 0.074. Thus, σ_η of 0.018 is approximately 23% of the standard deviation of the residual-based $FOPO^G$ variable.

[15] Average earnings as a percentage of assets in our sample is approximately -0.05. Thus, $\sigma_\eta \approx 0.02$ implies that reported EPS differs from 'true' EPS by roughly 40%.

[16] Interestingly, we find that the estimation error also has a small effect on the observed cash flow persistence slopes. While the drops in the earnings persistence slopes on CFO are modest, our evidence shows that estimation error in accruals can affect cash flow persistence in the earnings persistence regression framework. The modest effect is due to the fact that $FOPO^G$ is only weakly correlated with CFO after adjusting for joint-correlations with dWC, Dep, and $OthAcc^*$. The effect of estimation error on CF persistence could be considerably stronger if different accrual groupings were examined. We highlight this finding since prior studies generally assume estimation error does not affect the coefficient on cash flows.

In the interest of completeness, we perform similar analysis as reported in Table 6 for the 32 accrual types reported in Table 5. For each accrual type we determine the impact of estimation error on the magnitude of their persistence coefficient. We do not tabulate these results, but instead provide a graphical representation of the results in Figure 4. Figure 4 plots results for FOPO* accruals with positive persistence slopes that are more than two standard errors above zero (i.e. significant at conventional levels).[17] The key insight from Figure 4 is that, similar to results in Table 6, even when the effects of presumed accrual estimation error are removed, the adjusted FOPO* slopes remain lower than the slopes on cash flow (the exceptions are accruals related to stock-related compensation that are tied to the matching principle.)

In sum, the results in Table 6 and Figure 4 suggest that accrual estimation error: (i) cannot explain why FOPO accruals are less persistent than cash flow and (ii) cannot explain the variation in the earnings persistence of the individual FOPO accruals. These results suggest the estimation error is unlikely to be a primary explanation for our findings and support *P1* that the lower persistence of FOPO accruals, relative to cash flow, is largely driven by GAAP measurement rule variation.

[Figure 4 here]

The effect of reporting consistency on earnings persistence

One advantage of obtaining line-item detail at the firm level is that we can examine the evolution of firms' reporting choices. In this section, we investigate *P3* that predicts that reporting consistency is linked to earnings persistence. Recall that we operationalize reporting consistency as whether reported line items aggregated into FOPO in year t are also reported in the prior two fiscal years. Reporting consistency (Cons) is defined at the *line item* level; that is, a consistency score of 1.0 implies the firm reports the exact same line item in years t-2 and t-1 as it does in t.

[17] We exclude minority interest from this analysis since estimation error in these accruals are due to errors of other firms, not the firm recognizing the accrual.

When a firm reports multiple accruals within the same $FOPO^*$ accrual category, Cons is an average of the multiple line items comprising that accrual category. Thus, the reported Cons values represent the average percentage of firms across years that report a particular accrual for at least three years in a row.

Table 7 provides descriptive results concerning reporting consistency for the 32 FOPO accrual types. For comparative purposes to Cons, we report autocorrelation slopes (AR_1) and earnings persistence slopes (Pers) from Tables 3 and 5 for each of the $FOPO^*$ accruals. AR_1 slopes provide perspective on the percentage of one dollar of $FOPO^*_t$ that is expected to persist into $FOPO^*_{t+1}$. Earnings persistence slopes (Pers), in contrast, capture the percentage of one dollar of $FOPO^*_t$ that is expected to persist in NI_{t+1} that is not explained by year t cash flows or other accruals. Comparison of Cons to these statistics provides perspective on how reporting consistency compares to other accrual characteristics. In the subsequent two columns, we report conditional reporting probabilities. Specifically:

$R_{t+1}|C_t$ = the probability that, conditional on reporting an item in year t, and in t-1 and t-2, the firm reports the same line item in t+1. In contrast,

$R_{t+1}|NC_t$ = the probability that, conditional on reporting an item in year t, but not in t-1 and t-2, the firm reports that same line item in year t+1.

We investigate whether significant differences between $R_{t+1}|C_t$ and $R_{t+1}|NC_t$ (that reflect differences in reporting consistency) influences the predictive qualities of $FOPO^*$. We view these conditional probabilities as interesting independent of our other analysis since they represent the first broad sample evidence on reporting consistency in the academic literature. They are also important since differences in conditional reporting probabilities provide insight into the role of reporting consistency on earnings quality.

Table 7 provides several interesting empirical regularities. First, if a firm reports an item in years t, t-1, and t-2, it is much more likely to report the same item in t+1 than firms that do not report the item in years t-1 and t-2. This is noted in the column labelled "Diff" where values range from 0.056 to 0.273 indicating that conditional probabilities are generally between 6% to 27% higher for consistently reported $FOPO^*$ accruals. Second, we find that there are significant differences in Diff for the nondescript 'other' $FOPO^*$ accruals.[18] For example, firms that report OpMisc accruals—comprised of a 'hodge-podge' of descriptively reported accruals that do not fit into the other 31 categories—in t-1 and t-2 are significantly more likely to report it in t+1 (Diff =0.273, t-stat = 27.3). This supports the idea that reporting consistency may be informative about the recurring nature of *ad-hoc* accruals, an idea we test formally in Table 9 in multivariate settings.

[Table 7 here]

Table 8 provides regression analysis that examines the role of reporting consistency in explaining variation in earnings persistence. Specifically, we examine whether consistently reported accruals have different predictive qualities than the same accruals *not reported* in years t-1 and t-2. $FOPO^{GC}$ represents consistently reported $FOPO^{G}$ accruals, defined as the sum of the $FOPO^{G}$ accrual components reported in t (and years t-1 and t-2). In contrast, $FOPO^{GIC}$ represents the FOPO accrual components reported in t *but not* reported in both t-1 and t-2 (i.e., inconsistently reported accruals). In contrast to prior tables, we limit our consistency regressions to include firm year observations with completely mapped years t, t-1, and t-2. This sample is slightly smaller (2,422 firms per year) than the sample in prior tables, but no substantive differences exist between the samples. Panel A investigates whether reporting consistency varies by the nature of business

[18] By 'nondescript' we mean accruals such as OthAst, OthLiab, Other, OpMisc, and FinMisc. OthAst, OthLiab, and Other represent line items that are explicitly reported by the firms as 'other assets' or 'other liabilities', or 'other'; OpMisc and FinMisc represent a hodge-podge of accruals that are not reported by enough firms to warrant a distinct category in our study; as such, we group these accruals.

activity while panel B examines how reporting consistency affects the persistence of $FOPO^{G}$ accruals grouped by the GAAP measurement principle.

Table 8 reveals several important empirical regularities. First, predictive slopes on consistently reported accruals ($FOPO^{GC}$) are generally higher than the slopes on inconsistent accruals ($FOPO^{GIC}$). Full sample results reported in Model (1) show the slope on $FOPO^{GC}$ is 0.623, more than twice as large as the slope on $FOPO^{GIC}$ and significantly different (t-stat = 5.85). As noted earlier, consistency reflects the combined effect of both a recurring business activity and the measurement rules that record the activity. These full sample results suggest that consistent reporting improves earnings persistence irrespective of the underlying source of consistency.

In the subsequent columns across both panels, we decompose FOPO into $FOPO^{G}$ components. Panel A investigates whether reporting consistency varies by the nature of business activity while panel B examines how reporting consistency affects the persistence of $FOPO^{G}$ accruals grouped by the GAAP measurement principle. In panel A as it relates to operating activities, we find that consistency differences only explain variation in the earnings persistence for the set of total operating activities and a set of *ad hoc* FOPO operating accruals, labeled 'Other'. We do not find significant differences in the persistence of current and non-current operating asset FOPO accruals.

We believe there is an intuitive explanation for this result. By intent, our $FOPO^{G}$ groupings of $FOPO^{*}$ accruals aggregate similar accrual types together. Accruals within most of these groupings are similar, but not exactly the same, in terms of GAAP measurement rules and underlying business activities. For example, current operating accrual adjustments generally relate to accounts receivable and inventory which both tend to be recurring in nature (e.g., AR in Table 7 has $R_{t+1}|C_t$ = 0.781 and $R_{t+1}|NC_t$ = 0.639, suggesting a high probability for an AR provision in t+1 regardless of AR reporting consistency). Thus, little difference exists in the persistence of

FOPO based on how consistently a firm reports the accrual (0.650 versus 0.482). The same pattern holds for most of the other $FOPO^G$ groups. The key exception are the $FOPO^G$ groups that contain an aggregation of dissimilar accruals. These groupings include models (1), (4), and (5) in panel A and model (6) in panel B. It's likely that the GAAP measurement rules and the underlying business activities vary significantly within these accrual groups. We investigate this possibility more closely in Table 9.

[Table 8 here]

Table 9 examines the predictive qualities of generically labelled 'other' $FOPO^*$ accruals to determine whether there is a difference in the earnings persistence when a firm consistently reports the same item. Table 9 examines the seven $FOPO^*$ accruals that are either grouped together by the firm (OthAst, OthLiab, Other) or are grouped into generic 'catch-all' categories by us (OthGL, OthProv, OpMisc, and FinMisc). We use the same cross-sectional regression design as Table 8, but examine individual $FOPO^*$ accruals and test whether, if consistently reported, these accruals have different predictive qualities. The results suggest that consistently reported accruals are more persistent. Six of the $FOPO^*$ accruals exhibit stronger predictive power for future earnings when these accruals are consistently reported. Further, the slopes of three of the $FOPO^*$ accruals, when consistently reported, are more than two standard errors above zero. Of particular note, the strongest consistency effect is for the generic catchall category we formed, OpMisc, which aggregates accruals that do not map neatly into the other 31 categories we created. Many of the accruals that comprise this $FOPO^*$ category may be highly persistent; reporting consistency at the line-item level allows us to test for these effects. Consistent with our conjecture, the consistently reported OpMisc accruals exhibit significantly stronger earnings persistence relative to inconsistently reported items.

[Table 9 here]

In summary, the results in Tables 7 through Table 9 provide evidence on prediction *P3*. Our results suggest that reporting consistency is a different accrual quality attribute from earnings persistence but that consistently reported accruals, conditional on accrual type, are more persistent.

V. CONCLUSION

One of the most important empirical regularities in the accounting literature is the differential persistence of cash flow and accruals for future earnings. These differences factor prominently in studies of future stock returns (Sloan 1996), earnings quality (Dechow and Dichev 2002), investment efficiency (Richardson 2006), earnings prediction (Bradshaw et al. 2001), and many other subcategories of accounting literature. Beginning as early as Healy (1985), accrual studies in accounting and finance have largely relied on empirical variables that aggregate many different accrual types into a single accrual measure. These variables, often based on net changes in balance sheet values or aggregate differences between earnings and cash flow, mix investment-related accruals with earnings-based accruals (Oh and Penman 2020). As a consequence, a common challenge in many studies is one of a joint-hypothesis: are differences in the persistence of cash flows versus accruals due to different economic dynamics captured by accruals and cash flows or the estimation errors inherent in accruals?

We provide new insights into the joint-hypothesis challenge by disaggregating an economically important set of accruals reported on Compustat: Funds from Operations-Other, FOPO. Lewellen and Resutek (2016) label accruals included in FOPO as "nontransaction accruals" since many of these accruals are adjusting entries made by accountants at the end of the period, have a dollar for dollar impact on earnings, and are largely unrelated to investment transactions. Thus, analyzing accruals in FOPO has the advantage of (i) sidestepping the concern that correlated investment decisions impact accrual inferences and (ii) providing a set of accruals that have considerable heterogeneity in the GAAP measurement rules that are used to create the underlying accruals.

We disaggregate the Compustat FOPO data item into 32 different accrual types. We document that these accruals vary widely along three dimensions: (i) the nature of the business activity; (ii) whether the business activity is recurring; and (iii) the measurement rules used to record the activity. We show that these accruals vary significantly in how they persist into future earnings, and this variation can be intuitively linked to GAAP measurement rules and the reporting consistency of the accruals. Furthermore, when we apply reasonable empirical parameters to our model of accrual estimation error we show that it is implausible that the differences in accrual persistence are driven by managerial discretion/estimation error.

Our results highlight the value of obtaining precise data. Specifically, our results highlight that future accounting researchers should carefully consider both the business activity reflected in an accrual as well as the statistical properties induced into that accrual by the GAAP measurement rules before establishing inferences about accrual quality. Our results highlight that both of these factors influence accrual persistence and that these factors are likely to have far more impact on accrual persistence than estimation error or managerial discretion.

We note that accrual estimation error linked to the estimates managers must make about uncertain future cash flows play an important role in understanding the quality of earnings. While the debate on the relative importance of estimation error vs. other economic-based explanations has swirled in academic studies for at least 20 years, given the views of financial executives (Dichev et al. 2013), the costs firms incur to prevent accounting fraud through their internal- and external-audit functions, and the direct and indirect costs to investors (and others) of actual accounting fraud, estimation error clearly plays a critical role in the predictive qualities of accruals. Our study highlights that empirical estimates of discretion and estimation error are likely to be imprecise, especially when researchers use 'catch-all' aggregate accrual variables.

Our study also offers many opportunities for future research. We focus on the role of the 32 different accrual types for the predictability of future earnings. Another important avenue for investigation is to better understand the relation between the GAAP measurement rules that create the 32 different accruals for future cash flows, future stock returns, and more generally for valuation. Future research could also use the details of the 32 accrual types to develop and tests new measures of reporting discretion. Finally, researchers could investigate whether our measure of reporting consistency is correlated with other measures of reporting consistency and how reporting consistency relates to other attributes of financial reporting quality. Our hope is that our study, and the granular data associated with it, will help future researchers advance literatures examining accrual quality and its many implications for capital markets.

References

Ball, R., 2013. Accounting informs investors and earnings management is rife: Two questionable beliefs. Accounting Horizons, 27(4), 847-853.

Basu, S., and Waymire, G. B., 2010. Sprouse's what-you-may-call-its: Fundamental insight or monumental mistake?. Accounting Historians Journal, 37(1), 121-148.

Bradshaw, M. T., Richardson, S. A., and Sloan, R. G., 2001. Do analysts and auditors use information in accruals?. Journal of Accounting Research, *39*(1), 45-74.

Bromwich, M., Macve, R., and Sunder, S., 2010. Hicksian income in the conceptual framework. Abacus, 46(3), 348-376.

Bushman, R.M., Lerman, A. and Zhang, X., 2016. The changing landscape of accrual accounting. Journal of Accounting Research, 54(1), 41-78.

Dechow, P.M., 1994. Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. Journal of Accounting and Economics, 18(1), 3-42.

Dechow, P. M., and Dichev, I. D., 2002. The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review, *77*(s-1), 35-59.

Dechow, P. M., Hutton, A. P., Kim, J. H., and Sloan, R. G., 2012. Detecting earnings management: A new approach. Journal of Accounting Research, *50*(2), 275-334.

Dechow, P. M., Ge, W. and Schrand, C., 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. Journal of Accounting and Economics, 50(2-3), 344-401.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P., 1995. Detecting earnings management. The Accounting Review, 70(2), 193-225.

DeFond, M.L., 2010. Earnings quality research: Advances, challenges and future research. Journal of Accounting and Economics, 50(2-3), 402-409.

Dichev, I.D., Graham, J.R., Harvey, C. R. and Rajgopal, S., 2013. Earnings quality: Evidence from the field. Journal of Accounting and Economics, 56(2-3), 1-33.

Dichev, I. D., and Tang, V. W., 2009. Earnings volatility and earnings predictability. Journal of Accounting and Economics, 47(1-2), 160-181.

Fairfield, P. M., Whisenant, J. S., and Yohn, T. L., 2003. Accrued earnings and growth: Implications for future profitability and market mispricing. The Accounting Review, *78*(1), 353-371.

Fama, E.F. and MacBeth, J.D., 1973. Risk, return, and equilibrium: Empirical tests. Journal of Political Economy, 81(3), 607-636.

Francis, J., LaFond, R., Olsson, P. M., & Schipper, K., 2004. Costs of equity and earnings attributes. The Accounting Review, *79*(4), 967-1010.

Gerakos, J., 2012. Discussion of detecting earnings management: A new approach. Journal of Accounting Research, 50(2), 335-347.

Healy, P. 1985. The impact of bonus schemes on the selection of accounting principles. Journal of Accounting and Economics, *7*(1-3), 85-107.

Hribar, P. and Collins, D.W., 2002. Errors in estimating accruals: Implications for empirical research. Journal of Accounting Research, 40(1), 105-134.

Larson, C. R., Sloan, R., and Giedt, J. Z., 2018. Defining, measuring, and modeling accruals: a guide for researchers. Review of Accounting Studies, *23*(3), 827-871.

Lawrence, A., Sloan, R., & Sun, Y., 2013. Non-discretionary conservatism: Evidence and implications. Journal of Accounting and Economics, 56(2-3), 112-133.

Lewellen, J. and Resutek, R.J., 2016. The predictive power of investment and accruals. Review of Accounting Studies, 21(4), 1046-1080.

Lewellen, J., and Resutek, R. J., 2019. Why do accruals predict earnings?. Journal of Accounting and Economics, *67* (2-3), 336-356.

Nezlobin, A., Sloan, R.G. and Zha Geidt, J. 2019. Measuring accrual quality: A theoretical and empirical evaluation, working paper, University of Southern California.

Oh, H. I., & Penman, S. H. 2020. The Accruals-Cash Flow Relation and the Evaluation of Accrual Accounting. Working paper

Owens, E.L., Wu, J.S. and Zimmerman, J., 2017. Idiosyncratic shocks to firm underlying economics and abnormal accruals. *The Accounting Review*, *92*(2), pp.183-219.

Paton, W.A. and Littleton, A.C., 1940. An Introduction to Corporate Accounting Standards (Sarasota, FL: American Accounting Association).

Peterson, K., Schmardebeck, R. and Wilks. T. J., 2015. The earnings quality and information processing effects of accounting consistency. The Accounting Review, 90(6), 2483 -2514.

Richardson, S.A. 2006. Over-investment of free cash flow. Review of accounting studies, *11*(2-3), 159-189.

Richardson, S.A., Sloan, R.G., Soliman, M.T. and Tuna, I., 2005. Accrual reliability, earnings persistence and stock prices. Journal of Accounting and Economics, 39(3), 437-485.

Sprouse, R.T. 1966, Accounting for What-You-May-Call-Its, Journal of Accountancy, 122(4), 45-53.

Sloan, R., 1996. Do Stock Prices Fully Reflect Information in Accruals and Cash Flows About Future Earnings? The Accounting Review, 71(3), 289–315.

Srivastava, A., 2014. Selling-price estimates in revenue recognition and the usefulness of financial statements. Review of Accounting Studies, 19(2), 661-697.

Thomas, J. K., and Zhang, H. 2002. Inventory changes and future returns. Review of Accounting Studies, *7*(2-3), 163-187.

Appendix 1

This appendix builds from the measurement error model developed by Lewellen and Resutek (2019) and extends it along several key dimensions. In particular, we allow the cash- and accrual- components of current earnings to have different predictive slopes for future earnings absent any error in the estimation of accruals, diminishing returns on investment, or product market effects. Using this framework allows us to quantify how varying magnitudes of accrual estimation error could affect its predictive slope for future earnings observed in the data.

The regression of interest in the accrual literature examines the predictive power of the cash- and accrual- components of current earnings

$$NI_{t+1} = b_0 + b_1 CF_t + b_2 Acc_t + e_{t+1} \quad \textbf{(A1)}$$

We assume that observed cash flow is measured without error but allow observed accruals to contain estimation error such that $Acc_t = Acc_t^* + \eta_t$. Consistent with Lewellen and Resutek (2019), we assume perfectly measured accruals (Acc^*) and cash flow are uncorrelated with accrual measurement error (η), but allow for annual serial correlation in measurement error. (As discussed in Lewellen and Resutek, this assumption greatly simplifies the slope expressions with minimal effect to the CF and Acc persistence slopes. For example, if $-0.50 \leq \rho_{\eta,Acc^*} \leq 0.50$, predictive slopes change very little.)

Stacking the slopes in Eq. (A1) into a two element column vector b = (b_1, b_2) and the regressors into the vector $x_t = (CF_t, Acc_t)$, under standard OLS assumptions

$$b = var^{-1}(x_t)\, cov(x_t, NI_{t+1}). \quad \textbf{(A2)}$$

The observed variance-covariance matrix of x_t is defined as

$$var(x_t) = \begin{bmatrix} \sigma^2_{CF} & \sigma_{CF,Acc} \\ \sigma_{CF,Acc} & \sigma^2_{Acc} \end{bmatrix} = \begin{bmatrix} \sigma^2_{CF} & \sigma_{CF,Acc^*} \\ \sigma_{CF,Acc^*} & \sigma^2_{Acc^*} + \sigma^2_{\eta} \end{bmatrix} \quad \textbf{(A3)}$$

where $\sigma^2_{(\cdot)}$ and $\sigma_{(\cdot)}$ denote the variance and covariance of the respective variables. The inverse of the var (x_t) is

$$var^{-1}(x_t) = \frac{1}{Det}\begin{bmatrix} \sigma^2_{Acc} & -\sigma_{CF,Acc} \\ -\sigma_{CF,Acc} & \sigma^2_{CF} \end{bmatrix} \quad \textbf{(A4)}$$

where the determinant, Det, can be expressed

$$Det = \sigma^2_{CF}\sigma^2_{Acc} - \sigma^2_{CF,Acc} = \sigma^2_{CF}\sigma^2_{Acc}(1 - \rho^2_{CF,Acc}) \quad \textbf{(A5)}$$

with $\rho_{(\cdot)}$ denoting a correlation between variables. The covariance between x_t and NI_{t+1} can be expressed as

$$cov(x_t NI_{t+1}) = \begin{bmatrix} \gamma\sigma^2_{C} \\ \phi\sigma^2_{Acc^*} + \lambda\sigma^2_{\eta} \end{bmatrix} \quad \textbf{(A6)}$$

where, γ is the univariate slope on CF_t for NI_{t+1}, ϕ is the univariate slope on Acc^*_t for NI_{t+1}, and consistent with Lewellen and Resutek, λ is the first-order serial correlation of η_t. Substituting (A4) and (A6) into (A2), column vector b can be expressed

$$b = \frac{1}{Det}\begin{bmatrix} \sigma^2_{Acc} & -\sigma_{CF,Acc} \\ -\sigma_{CF,Acc} & \sigma^2_{CF} \end{bmatrix}\begin{bmatrix} \gamma\sigma^2_{CF} \\ \phi\sigma^2_{Acc^*} + \lambda\sigma^2_{\eta} \end{bmatrix} \quad \textbf{(A7)}$$

The individual elements of column vector b can be derived as

$$b_1 = \frac{1}{\text{Det}}\left(\gamma\sigma^2_{CF}\sigma^2_{Acc} - \sigma_{CF,Acc}\left(\phi\sigma^2_{Acc^*} + \lambda\sigma^2_{\eta}\right)\right)$$

$$= \frac{1}{\text{Det}}\left(\gamma\sigma^2_{CF}\sigma^2_{Acc} - \sigma_{CF,Acc}\left(\phi\sigma^2_{Acc} - \phi\sigma^2_{\eta} + \lambda\sigma^2_{\eta}\right)\right)$$

$$= \frac{1}{\text{Det}}\left(\gamma\sigma^2_{CF}\sigma^2_{Acc} - \sigma_{CF,Acc}\left(\phi\sigma^2_{Acc} + \sigma^2_{\eta}(\lambda - \phi)\right)\right)$$

$$= \frac{\gamma\sigma^2_{CF}\sigma^2_{Acc} - \sigma_{CF,Acc}\left(\phi\sigma^2_{Acc} + \sigma^2_{\eta}(\lambda-\phi)\right)}{\sigma^2_{CF}\sigma^2_{Acc}\left(1-\rho^2_{CF,Acc}\right)}$$

$$b_2 = \frac{1}{\text{Det}}\left(-\gamma\sigma_{CF,Acc}\sigma^2_{CF} + \sigma^2_{CF}\left(\phi\sigma^2_{Acc^*} + \lambda\sigma^2_{\eta}\right)\right)$$

$$= \frac{1}{\text{Det}}\left(-\gamma\sigma_{CF,Acc}\sigma^2_{CF} + \sigma^2_{CF}\left(\phi\sigma^2_{Acc} - \phi\sigma^2_{\eta} + \lambda\sigma^2_{\eta}\right)\right)$$

$$= \frac{1}{\text{Det}}\sigma^2_{CF}\left(\phi\sigma^2_{Acc} + \sigma^2_{\eta}(\lambda - \phi) - \gamma\sigma_{CF,Acc}\right)$$

$$= \frac{\phi\sigma^2_{Acc} + \sigma^2_{\eta}(\lambda-\phi) - \gamma\sigma_{CF,Acc}}{\sigma^2_{Acc}\left(1-\rho^2_{CF,Acc}\right)}$$

Despite the fact that ϕ, λ and σ^2_{η} cannot be explicitly observed, inferences of the economic significance of accrual estimation error and its (possible) effect on earnings persistence slopes can be made. Eq. (A8) highlights that by assuming values for λ and σ^2_{η}, ϕ can be estimated. Once a value ϕ is set, b_1^{adj} and b_2^{adj} can be estimated using the formulas for b_1 and b_2 and setting σ^2_{η} to zero We define b_1^{adj} and b_2^{adj} as estimates of the earnings persistence slopes on CF and Acc if the effects of presumed accrual estimation error were removed.

$$\Phi = \frac{1}{(\sigma^2_{Acc}-\sigma^2_{\eta})} \times \left(b_2\, \sigma^2_{Acc}\left(1-\rho^2_{CF,Acc}\right) + \gamma\sigma_{CF,Acc} - \sigma^2_{\eta}\lambda\right) \qquad \textbf{(A8)}$$

Figure 1
Number of FOPO components reported over time

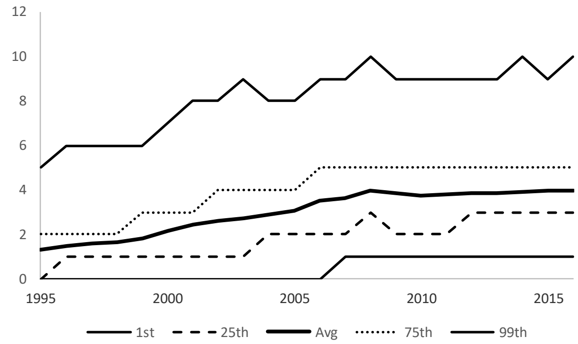

Figure 2
Difference between |FOPO| and Σ|FOPO|**

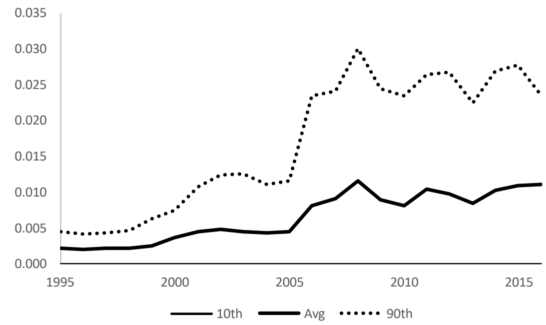

Figure 1 plots the cross-sectional average (and select percentiles) of the number of line items that are aggregated into the FOPO data item. The average number has increased from 1.3 in 1995 to 4.0 in 2016. Figure 2 plots the difference between the absolute value of the FOPO data item |FOPO| and the sum of the absolute value of the 32 accruals that comprise the FOPO data item Σ|FOPO*|. Figure 2 provides perspective on how income increasing and income decreasing FOPO* accruals can offset each other due to the aggregation of the accruals into the FOPO data item.

Figure 3a
FOPO Composition, equal-weighted

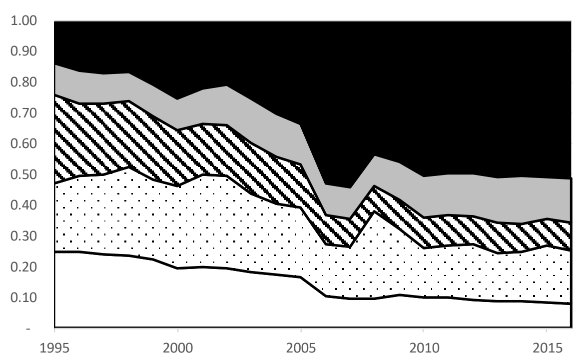

Figure 3b
FOPO Composition, value-weighted

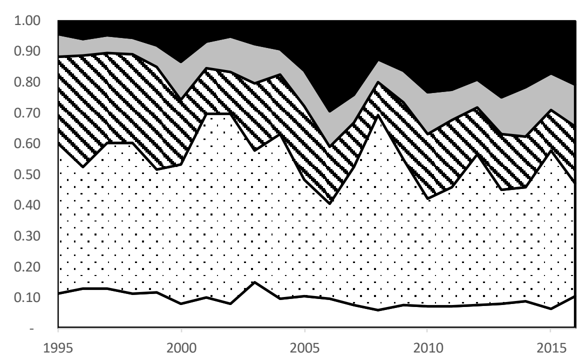

Figure 3a reports the average percentage of the sum of the absolute value of FOPO (as a percent of assets) on an equal-weighted basis. For each firm-year, we sum the absolute value of each FOPO component and plot the average percentage of each component over time. Figure 3b reports the value-weighted averages. Each year, we individually sum the absolute value of each of the FOPO components and plot, on a component level, the percentage of the total.

Figure 4
Sensitivity of earnings persistence slope on $FOPO^G$ to estimation error, by $FOPO^*$

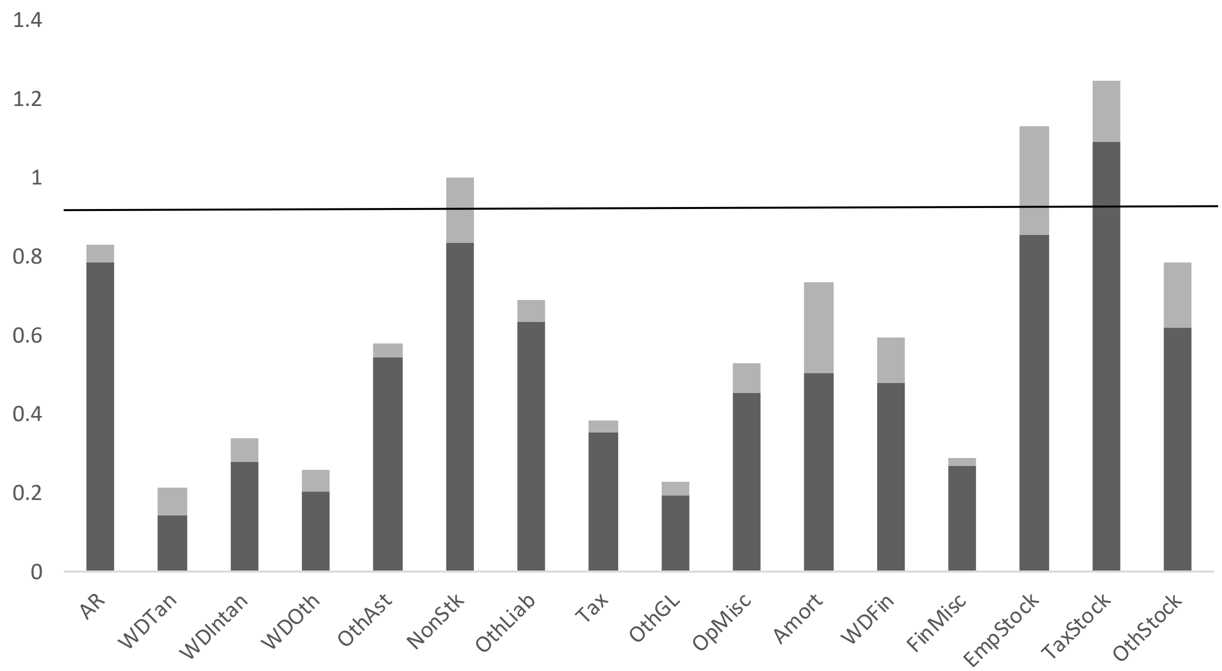

Figure 4a reports the actual earnings persistence slope on $FOPO^*$ as reported in Table 5 (dark gray) and the marginal change in the slope if an assumed amount of accrual estimation error were removed from observed $FOPO^*$ (light gray). The sum of the two parts of each bar is an estimate of the earnings persistence slope on $FOPO^*$ if the assumed amount of accrual estimation error was removed. Our estimates of the marginal changes in $FOPO^*$ persistence slopes due to estimation error follow the same empirical design as discussed in Table 6. We assume estimation error reverses in one year ($\lambda = -½$) and that the variance of estimation error is 5% of the variance of the residual-based proxy of each $FOPO^*$ accrual. We only report these amounts for $FOPO^*$ accruals with positive persistence slopes in Table 5 at least two standard errors from zero and exclude minority interest. The horizontal line at 0.93 is the earnings persistence slope on CFO.

Table 1
Sample Selection

Table 1 reconciles the complete sample ('Full') to the sample that we can map Statement of Cash Flow items ('Map'). Our full sample includes all firms on the CRSP/Compustat merged database meeting the following criteria: (i) fiscal year ends between 1995:06 and 2017:05; (ii) traded on U.S. exchanges (CRSP sharecodes 1, 2, 3); (iii) ordinary share classes of US incorporated firms (CRSP share codes 10-11); (iv) valid fiscal year end market equity (per CRSP); and non-missing earnings before extraordinary items, depreciation, FOPO, and cash flow from operations per the SCF. We exclude all financial firms (SIC codes 6000-6999, per CRSP) and firms with missing SIC codes.

	Firm-Years
Full Sample:	85,117
Missing CIKs in Compustat	1,596
No files on Edgar for Compustat reported CIK	3,019
No identifiable statement of cash flows in 10K filings	2,833
Error in parsing Edgar filing	175
Incomplete FOPO mapping between Compustat and cash flow statement	9,550
Map Sample	67,944
Number of unique firms	9,599
Average number of unique firms per annual cross-section	3,088
Standard deviation per annual cross-section	626
Minimum number of unique firms in a given year	2,524
Maximum number of unique firms in a given year	4,421

Table 2
Summary statistics, 1995-2016

Panel A reports time-series averages of annual cross-sectional means (Avg.), standard deviations (Std.), medians (Med), 1st and 99th percentiles, and first-order autocorrelations (AR_1). Panel B reports time-series averages of the annual cross-sectional Pearson product-moment correlations (below the diagonal) and Spearman rank correlations (above the diagonal). The sample includes all firms in the 'Map' sample (as described in Table 1). Variables are signed consistent with earnings and defined below. AR_1 is the average annual slope (b_1) from annual regressions: $Var_{t+1} = b_0 + b_1 Var_t$. Correlations in panel B greater than 0.30 are in bold. All variables are annually winsorized at the 1st and 99th percentile and scaled by average total assets.

Panel A: Time series averages of cross-sectional summary statistics

		(Annual cross-sectional averages)					
Variable	**Description**	**Avg.**	**Std.**	**1st**	**Med**	**99th**	**AR_1**
CFO[a]	Cash flow from operations	0.024	0.208	-0.889	0.071	0.363	0.796
Dep[b]	Depreciation	-0.050	0.037	-0.217	-0.042	-0.003	0.877
FOPO[c]	FOPO	-0.037	0.081	-0.483	-0.011	0.069	0.325
OthAcc[d]	NTAcc – FOPO – Dep	0.003	0.030	-0.094	0.000	0.161	0.118
dWC[e]	Working capital accruals	0.012	0.072	-0.228	0.008	0.276	0.114
NI[f]	Income before x-ord. items	-0.049	0.253	-1.193	0.028	0.296	0.776
Other accrual specifications:							
TotAcc[g]	Total accruals; NI - CFO	-0.074	0.129	-0.650	-0.055	0.253	0.272
NTAcc[h]	Nontransaction accruals	-0.085	0.102	-0.591	-0.061	0.119	0.415

Panel B: Correlations

	CFO	Dep	FOPO	OthAcc	dWC	NI
CFO	-	-0.21	0.16	-0.07	-0.26	**0.71**
Dep	-0.08	-	0.07	-0.01	0.03	0.07
FOPO	0.27	0.11	-	-0.15	-0.02	**0.37**
OthAcc	-0.05	-0.02	-0.11	-	-0.06	-0.02
dWC	-0.18	0.01	-0.01	-0.04	-	0.16
NI	**0.84**	0.13	**0.57**	0.05	0.15	-

[a] Cash flow from operations; (OANCF)
[b] Depreciation; – (DPC)
[c] Funds from operations adjusting accruals; – (FOPO)
[d] Other adjusting accruals; – (XIDOC+TXDC+SPPIV+ESUBC)
OthAcc = – (extraordinary items / discontinued operations +
deferred taxes +
gains / losses from sales of PP&E and investments +
earnings from unconsolidated subsidiaries)
[e] Working capital adjusting accruals; – (RECCH+INVCH+APALCH+TXACH+AOLOCH)
dWC = – (Δaccounts receivable +
Δinventory +
Δaccounts payable +
Δaccrued taxes +
Δother assets and liabilities)
[f] Earnings before extraordinary items; (IBC)
[g] Total accruals; (IBC – OANCF)
[h] Nontransaction accruals; – (DPC+XIDOC+FOPO+TXDC+SPPIV+ESUBC)

Table 3
Descriptive statistics for FOPO*, 1995–2016

This table reports time-series averages of annual cross-sectional means (Avg.), standard deviations (Std.), medians (Med), 1st and 99th percentiles, and first-order autocorrelations (AR_1) for the components of FOPO (FOPO*). The sample includes all firms comprising our 'Map Sample', defined in Table 1. AR_1 slopes require FOPO* to be non-missing for at least 25 firms and have at least 5 valid cross-sections. AR_1 slopes that are not statistically different from 0.0 are italicized. $FOPO^*_{t+1}$ values are set to zero if missing. FOPO* is our generic name for the 32 different accrual types listed below.

FOPO*	Description	Avg.	Std.	1st	Med	99th	AR_1	Obs.
Operating: Current								
Current Assets								
AR	AR provisions and allowances	-0.008	0.017	-0.105	-0.003	0.011	0.680	1027.8
Inv	Inv. provisions and allowances	-0.015	0.027	-0.159	-0.007	0.027	0.317	263.0
Current Liabilities								
Wrnty	Warranty provisions	-0.009	0.013	-0.046	-0.005	0.008	-	18.1
DefRev	Deferred revenue adjustments	0.007	0.060	-0.230	0.003	0.255	*0.154*	61.2
Operating: Non Current								
Non-Current Assets								
WDTan	Tangible asset writedowns	-0.028	0.064	-0.417	-0.006	0.004	0.143	145.7
WDIntan	Intangible asset writedowns	-0.085	0.146	-0.822	-0.028	0.001	0.105	286.6
WDOth	Other/misc. writedowns	-0.043	0.088	-0.522	-0.010	0.018	0.206	339.9
OthAst	Other/misc asset adjustments	-0.001	0.021	-0.079	-0.001	0.092	0.321	123.6
Non-Current Liabilities								
Restr	Restructuring charges	-0.018	0.033	-0.187	-0.008	0.024	0.123	229.1
Legal	Enviromntl/Litigation charges	-0.010	0.057	-0.209	-0.003	0.149	*-0.012*	40.6
ARO	Asset retirement charges	-0.001	0.011	-0.024	-0.001	0.021	-	17.8
NonStock	Deferred non-stock comp.	-0.005	0.019	-0.113	-0.002	0.042	0.417	404.1
OthLiab	Other/misc liab. adjustments	0.000	0.037	-0.111	0.000	0.123	0.269	37.0
Operating: Other								
Tax	Tax-related adjustments	0.003	0.046	-0.171	-0.000	0.260	*0.034*	89.6
Bargain	Gain on bargain purchase	0.014	0.017	0.004	0.008	0.061	-	9.3
OthGL	Other gains/losses	0.006	0.062	-0.199	0.000	0.370	*0.060*	143.0
OthProv	Other provisions	-0.012	0.036	-0.226	-0.002	0.063	0.328	103.0
Other	Other charges	-0.001	0.006	-0.026	-0.001	0.016	0.357	746.1
OpMisc	Miscellaneous/uncategorized	-0.012	0.050	-0.295	-0.003	0.134	0.337	289.7
Financial								
Recurring div/interest								
Amort int.	Prem/disct amort; interest	-0.008	0.026	-0.166	-0.002	0.027	0.480	564.0
Dividends	Dividends (non-cash)	-0.001	0.007	-0.013	-0.001	0.010	-	7.6
Fair Value Adjustments								
DbtExt	Early debt extinguishment	-0.006	0.049	-0.151	-0.003	0.185	0.107	194.9
GLFI	Gain/loss on fin. instrument	0.003	0.043	-0.134	0.000	0.193	0.159	98.6
FVAdj	Fair-value adjustment	-0.018	0.192	-1.525	-0.000	0.196	*0.055*	251.9
WDFin	Fin. asset/liab. writedowns	-0.020	0.052	-0.332	-0.005	0.010	0.178	96.1
Other								
Curr	Currency-related adjustments	-0.000	0.008	-0.037	0.000	0.029	*0.054*	155.0
Cash	Restricted cash adjustments	0.006	0.021	-0.010	0.006	0.021	-	3.2
FinMisc	Miscellaneous/uncategorized	0.000	0.055	-0.238	0.000	0.260	*0.051*	92.6
Shareholders' Equity								
Compensation								
EmpStock	Stock-based comp – employee	-0.018	0.031	-0.189	-0.006	0.003	0.613	1541.7
TaxStock	Excess tax benefit; stock comp	-0.005	0.014	-0.052	-0.002	0.023	0.428	517.0
Other								
OthStock	Expenses paid with stock	-0.031	0.096	-0.662	-0.005	0.040	0.441	131.2
MI	Minority interest	-0.001	0.011	-0.039	-0.001	0.043	0.511	228.3

Table 4
Earnings persistence regressions, 1995–2016

This table reports average slopes from annual cross-sectional regressions of future net income on operating cash flow and accrual components in year t. The t-statistics are based on the time-series variability of the slope estimates, incorporating a Newey-West correction with three lags to account for possible autocorrelation in the estimates. $FOPO^G$ is the sum of the $FOPO^*$ components as defined below each panel. We require $FOPO^G$ to be non-missing in at least 25 firms and at least 5 valid cross-sections. $OthAcc^*$ varies by regression and is equal to NI – CFO – $FOPO^G$ – Dep – dWC. All other variables are defined in Table 2 and winsorized annually. Regressions average 2,745 observations per cross-section.

Model: $NI_{t+1} = a_0 + a_1 CFO_t + a_2 FOPO^G_t + a_3 OthAcc^*_t + a_4 Dep_t + a_5 dWC_t + e_{t+1}$

Panel A: $FOPO^G$ by function

		$FOPO^G$ Components						
		Operating				Financial	S/Equity	
Model:	**All (1)**	**Current (2)**	**N/Current (3)**	**Other (4)**	**Total (5)**	**Total (6)**	***ex* Tax (7)**	**Total (8)**
CFO_t	0.933	0.935	0.934	0.935	0.932	0.931	0.902	0.901
t	(128.41)	(118.86)	(121.29)	(119.07)	(121.94)	(125.14)	(95.56)	(86.16)
$FOPO^G_t$	0.333	0.615	0.226	0.430	0.286	0.245	0.937	0.987
t	(13.84)	(5.29)	(7.11)	(6.26)	(10.04)	(2.42)	(10.67)	(11.73)
$OthAcc^*_t$	0.369	0.309	0.405	0.316	0.427	0.353	0.257	0.251
t	(10.06)	(13.68)	(15.97)	(17.17)	(12.48)	(10.66)	(12.64)	(12.85)
Dep_t	0.864	0.868	0.880	0.867	0.873	0.859	0.856	0.855
t	(23.01)	(23.71)	(23.53)	(23.38)	(23.42)	(25.03)	(24.57)	(25.05)
dWC_t	0.724	0.730	0.731	0.725	0.725	0.722	0.696	0.697
t	(17.51)	(16.96)	(18.21)	(17.26)	(17.46)	(17.52)	(20.32)	(20.77)
R^2	0.637	0.637	0.638	0.637	0.638	0.638	0.641	0.642
Tests for differences in coefficients								
$FOPO^G$ – $OthAcc^*$	-0.037	0.306	-0.179	0.114	-0.141	-0.107	0.680	0.736
t	(-0.90)	(2.49)	(-4.12)	(1.79)	(-2.92)	(-0.85)	(6.78)	(7.73)
$FOPO^G$ – CFO	-0.600	-0.320	-0.708	-0.505	-0.646	-0.686	0.035	0.086
t	(-28.99)	(-2.79)	(-25.66)	(-7.40)	(-26.39)	(-6.63)	(0.37)	(0.94)
$FOPO^G$ – dWC	-0.391	-0.115	-0.505	-0.295	-0.439	-0.476	0.241	0.290
t	(-10.56)	(-1.11)	(-21.88)	(-3.49)	(-14.62)	(-3.45)	(2.72)	(3.46)

Note the accrual types include in regression models (2) through (8) are as follows:

Operating

Current (2): AR + Inv + Wrnty + DefRev

Non-Current (3): WDTan + WDIntan + WDOth + OthAst + Restr + Legal + ARO + NonStock + OthLiab

Other (4): Tax + Bargain + OthGL + OthProv + Other + OpMisc

Total (5): (2) + (3) + (4)

Financial

Total (6): Amort + Div + DbtExt + GLFI + FVAdj + WDFin + Curr + Cash + FinMisc

Shareholders' Equity

Ex Tax (7): EmpStock + OthStock + MI

Total (8): EmpStock + TaxStock + OthStock + MI

Table 4 - continued

Panel B: $FOPO^G$ by GAAP measurement principle

		$FOPO^G$ Components				
		Operating		Financial		Mixed
Model:	**All (1)**	**Matching (2)**	**Conservatism (3)**	**Matching (4)**	**Fair Value (5)**	**Total (6)**
CFO_t	0.933	0.905	0.935	0.934	0.930	0.934
t	(128.41)	(92.04)	(119.75)	(117.50)	133.748	(120.04)
$FOPO^G_t$	0.333	0.899	0.246	0.498	0.224	0.196
t	(13.84)	(11.50)	(7.49)	(4.89)	(1.41)	(3.54)
$OthAcc^*_t$	0.369	0.234	0.377	0.317	0.342	0.343
t	(10.06)	(9.87)	(16.58)	(14.99)	(12.65)	(17.58)
Dep_t	0.864	0.852	0.879	0.866	0.853	0.866
t	(23.01)	(24.55)	(23.88)	(22.21)	(26.39)	(23.23)
dWC_t	0.724	0.716	0.730	0.724	0.721	0.724
t	(17.51)	(19.89)	(17.76)	(17.23)	(17.54)	(17.17)
R^2	0.637	0.642	0.637	0.637	0.638	0.637
Tests for differences in coefficients						
$FOPO^G$ – $OthAcc^*$	-0.037	0.665	-0.132	0.181	-0.117	-0.147
t	(-0.90)	(7.06)	(-3.59)	(1.68)	(-0.68)	(-2.48)
$FOPO^G$ – CFO	-0.600	-0.006	-0.689	-0.436	-0.706	-0.739
t	(-28.99)	(-0.07)	(-24.32)	(-4.25)	(-4.41)	(-13.32)
$FOPO^G$ – dWC	-0.391	0.184	-0.484	-0.226	-0.497	-0.529
t	(-10.56)	(2.59)	(-19.23)	(-2.02)	(-2.60)	(-7.46)

Note the accrual types include in regression models (2) through (6) are as follows:
Operating
Matching (2): AR + NonStock + EmpStock + TaxStock + OthStock + MI + DefRev + Wrnty
Conservatism (3): Inv + WDTan + WDIntan + WDFin + WDOth + Legal
Financial
Matching (4): Amort + Div
Fair Value (5): GLFI + FVAdj + Curr + Cash
Mixed
Total (6): OthAst + Restr + ARO + OthLiab + OthProv + Tax + Other + OpMisc + OthGL + Bargain + DbtExt + FinMisc

Table 5

Earnings persistence regressions by FOPO* components, 1995–2016

This table reports average slopes from annual cross-sectional regressions of future net income on operating cash flow and accrual components. The t-statistics are based on the time-series variability of the slope estimates, incorporating a Newey-West correction (3 lags). We require FOPO* to be non-missing in at least 25 firms and at least 5 valid cross-sections. OthAcc* varies by regression specification and is equal to NI – CFO – FOPO* – Dep – dWC. If FOPO* is non-missing in at least 25 firms and there are at least 5 valid annual cross-sections, all missing FOPO* values are set to zero. The average cross-section has 2,745 observations. FOPO* is our generic name for the 32 accrual types detailed in Table 3.

Model: $NI_{t+1} = a_0 + a_1\, CFO_t + a_2\, FOPO^*_t + a_3\, OthAcc^*_t + a_4\, Dep_t + a_5\, dWC_t + e_{t+1}$

FOPO*	FOPO* (1)	OthAcc* (2)	Differences: FOPO* – OthAcc* (3)	FOPO* – CFO (4)	FOPO* – dWC (5)
Operating					
Current Assets					
AR	0.785	0.308	0.476	-0.151	0.053
t	(6.37)	(14.91)	(3.85)	(-1.24)	(0.47)
Inv	0.380	0.316	0.064	-0.554	-0.345
t	(1.85)	(14.75)	(0.30)	(-2.71)	(-1.83)
Current Liabilities					
DefRev	0.111	0.316	-0.205	-0.824	-0.614
t	(0.59)	(16.11)	(-1.09)	(-4.44)	(-3.61)
Non-Current Assets					
WDTan	0.141	0.322	-0.180	-0.794	-0.584
t	(2.45)	(16.14)	(-3.10)	(-13.45)	(-8.48)
WDIntan	0.277	0.336	-0.059	-0.658	-0.449
t	(6.83)	(20.50)	(-1.87)	(-16.70)	(-7.67)
WDOth	0.202	0.334	-0.132	-0.733	-0.525
t	(2.80)	(14.63)	(-1.67)	(-10.89)	(-13.45)
OthAst	0.542	0.316	0.226	-0.393	-0.183
t	(2.96)	(15.83)	(1.19)	(-2.12)	(-0.92)
Non-Current Liabilities					
Restr	-0.448	0.330	-0.778	-1.383	-1.174
t	(-2.80)	(16.22)	(-4.70)	(-8.57)	(-6.59)
Legal	-0.153	0.319	-0.472	-1.088	-0.878
t	(-1.01)	(15.84)	(-3.09)	(-7.28)	(-6.09)
NonStk	0.835	0.314	0.521	-0.099	0.110
t	(8.29)	(15.43)	(5.09)	(-0.97)	(0.95)
OthLiab	0.637	0.314	0.323	-0.298	-0.115
t	(2.06)	(22.13)	(1.03)	(-0.95)	(-0.34)
Other					
Tax	0.355	0.316	0.039	-0.580	-0.369
t	(2.27)	(16.02)	(0.26)	(-3.72)	(-2.12)
OthGL	0.194	0.318	-0.124	-0.741	-0.531
t	(2.69)	(16.15)	(-1.58)	(-9.82)	(-5.93)
OthProv	0.280	0.318	-0.038	-0.655	-0.445
t	(1.65)	(16.04)	(-0.23)	(-3.91)	(-2.65)
Other	-0.229	0.317	-0.545	-1.164	-0.953
t	(-0.92)	(15.75)	(-2.22)	(-4.62)	(-3.56)
OpMisc	0.456	0.312	0.144	-0.479	-0.269
t	(6.33)	(16.99)	(1.95)	(-6.47)	(-2.83)

Table 5 - continued

FOPO*	FOPO* (1)	OthAcc* (2)	Differences: FOPO* – OthAcc* (3)	FOPO* – CFO (4)	FOPO* – dWC (5)
Financial					
Recurring					
Amort	0.504	0.317	0.187	-0.430	-0.220
t	(4.95)	(14.99)	(1.73)	(-4.18)	(-1.95)
Fair-value adjustments					
DbtExt	-0.252	0.318	-0.569	-1.194	-1.023
t	(-1.70)	(16.10)	(-3.52)	(-7.90)	(-6.18)
GLFI	0.205	0.327	-0.122	-0.731	-0.525
t	(0.71)	(16.90)	(-0.42)	(-2.49)	(-1.63)
FVAdj	0.189	0.338	-0.148	-0.742	-0.535
t	(1.95)	(13.55)	(-1.33)	(-7.51)	(-4.21)
WDFin	0.481	0.322	0.158	-0.458	-0.259
t	(2.78)	(15.63)	(0.87)	(-2.67)	(-1.59)
Other					
Curr	-0.480	0.317	-0.797	-1.416	-1.205
t	(-0.62)	(15.88)	(-1.04)	(-1.83)	(-1.53)
FinMisc	0.268	0.317	-0.049	-0.667	-0.457
t	(2.77)	(15.65)	(-0.49)	(-6.67)	(-3.74)
Shareholders' Equity					
Compensation					
EmpStock	0.854	0.271	0.583	-0.053	0.156
t	(6.82)	(13.46)	(4.39)	(-0.40)	(1.28)
TaxStock	1.092	0.313	0.779	0.154	0.362
t	(6.70)	(16.05)	(4.83)	(0.95)	(1.96)
Other					
OthStock	0.619	0.302	0.317	-0.315	-0.098
t	(4.94)	(14.13)	(2.55)	(-2.59)	(-0.86)
MI	0.753	0.299	0.454	-0.174	0.076
t	(4.59)	(10.43)	(2.87)	(-1.03)	(0.38)

Table 6
Estimating the effects of potential estimation error in accruals on earnings persistence

This table reports the average slopes on observed CFO and $FOPO^G$ (Unadjusted) and the estimated average slopes on CFO and $FOPO^G$ if the statistical effects of estimation error were removed (Adjusted for estimation error). Each year, we regress CFO_t and $FOPO^G_t$ on $OthAcc^G_t$, Dep_t, and dWC_t. Residuals from these regressions serve as proxies for CFO_t and $FOPO^G_t$ that are orthogonal to other year t accruals. We then use the annual statistical properties of these residual-based variables to estimate what the average slopes on CFO and $FOPO^G$ would be if the statistical effects of estimation error were removed. See equations (2) and (3) for formulas. We assume that estimation error completely reverses in one year (λ = -½) and that the variance of estimation error is 5% of the residual-based accrual variance. The top half of each panel mirrors results from table 4; the bottom half reports estimates of the slope coefficients on CFO and $FOPO^G$ for future net income adjusted for assumed estimation error (CFO^{Adj} and $FOPO^{GAdj}$). All t-statistics are based on time-series variation in the slope estimates and incorporate Newey-West correction with three lags. Regressions average 2,745 observations per cross-section.

Panel A: $FOPO^G$ by function

		$FOPO^G$ Components						
		Operating				**Financial**	**S/Equity**	
Model:	**All (1)**	**Current (2)**	**N/Current (3)**	**Other (4)**	**Total (5)**	**Total (6)**	***ex* Tax (7)**	**Total (8)**
Unadjusted								
CFO	0.933	0.935	0.934	0.935	0.932	0.931	0.902	0.901
t	(128.41)	(118.86)	(121.29)	(119.07)	(121.94)	(125.14)	(95.56)	(86.16)
$FOPO^G$	0.333	0.615	0.226	0.430	0.286	0.245	0.937	0.987
t	(13.84)	(5.29)	(7.11)	(6.26)	(10.04)	(2.42)	(10.67)	(11.73)
CFO – $FOPO^G$	0.600	0.320	0.708	0.505	0.646	0.686	-0.035	-0.086
t	(28.99)	(2.79)	(25.66)	(7.40)	(26.39)	(6.63)	(-0.37)	(-0.94)
Adjusted for estimation error								
CFO^{Adj}	0.923	0.935	0.932	0.934	0.930	0.930	0.887	0.885
t	(143.19)	(118.52)	(120.60)	(118.52)	(120.40)	(123.08)	(72.38)	(61.84)
$FOPO^{GAdj}$	0.423	0.688	0.287	0.489	0.350	0.339	1.207	1.243
t	(14.65)	(5.75)	(8.61)	(6.55)	(11.67)	(2.87)	(10.98)	(10.41)
Test for differences in coefficients								
CFO^{Adj} – $FOPO^{GAdj}$	0.501	0.247	0.645	0.445	0.579	0.590	-0.320	-0.358
t	(19.46)	(2.09)	(22.35)	(5.97)	(22.47)	(4.89)	(-2.67)	(-2.72)
$FOPO^G$ – $FOPO^{GAdj}$	-0.090	-0.073	-0.061	-0.059	-0.064	-0.094	-0.270	-0.256
t	(15.37)	(-12.25)	(-24.50)	(-6.44)	(-26.65)	(-5.00)	(-10.26)	(-6.60)

Note the accrual types include in regression models (2) through (8) are as follows:

<u>Operating</u>

Current (2):	AR + Inv + Wrnty + DefRev
Non-Current (3):	WDTan + WDIntan + WDOth + OthAst + Restr + Legal + ARO + NonStock + OthLiab
Other (4):	Tax + Bargain + OthGL + OthProv + Other + OpMisc
Total (5):	(2) + (3) + (4)

<u>Financial</u>

Total (6):	Amort + Div + DbtExt + GLFI + FVAdj + WDFin + Curr + Cash + FinMisc

<u>Shareholders' Equity</u>

Ex Tax (7):	EmpStock + OthStock + MI
Total (8):	EmpStock + TaxStock + OthStock + MI

Table 6 - continued

Panel B: $FOPO^G$ by GAAP measurement principle

		$FOPO^G$ Components				
		Operating		Financial		Mixed
Model:	All (1)	Matchin (2)	Conservatism (3)	Matching (4)	Fair Value (5)	Total (6)
Unadjusted						
CFO_t	0.933	0.905	0.935	0.934	0.930	0.934
t	(128.41)	(92.04)	(119.75)	(117.50)	(133.74)	(120.04)
$FOPO^G_t$	0.333	0.899	0.246	0.498	0.224	0.196
t	(13.84)	(11.50)	(7.49)	(4.89)	(1.41)	(3.54)
$CFO - FOPO^G$	0.600	0.006	0.689	0.436	0.706	0.739
t	(28.99)	(0.07)	(24.32)	(4.25)	(4.41)	(13.32)
Adjusted for estimation error						
CFO^{Adj}	0.923	0.892	0.933	0.932	0.929	0.934
t	(143.19)	(72.93)	(119.14)	(118.80)	(133.17	(119.54)
$FOPO^{GAdj}$	0.423	1.108	0.307	0.729	0.252	0.249
t	(14.65)	(10.72)	(8.90)	(6.85)	(1.48)	(4.48)
Test for differences in coefficients						
$CFO^{Adj} - FOPO^{GAdj}$	0.501	-0.216	0.626	0.202	0.677	0.685
t	(19.46)	(-1.91)	(20.88)	(1.89)	(3.94)	(12.29)
$FOPO^G - FOPO^{GAdj}$	-0.090	-0.209	-0.061	-0.231	-0.028	-0.053
t	(15.37)	(-6.83)	(-20.08)	(-18.67)	(-2.07)	(-9.86)

Note the accrual types include in regression models (2) through (6) are as follows:

<u>Operating</u>

Matching (2): AR + NonStock + EmpStock + TaxStock + OthStock + MI + DefRev + Wrnty

Conservatism (3): Inv + WDTan + WDIntan + WDFin + WDOth + Legal

<u>Financial</u>

Matching (4): Amort + Div

Fair Value (5): GLFI + FVAdj + Curr + Cash

<u>Mixed</u>

Total (6): OthAst + Restr + ARO + OthLiab + OthProv + Tax + Other + OpMisc + OthGL + Bargain + DbtExt + FinMisc

Table 7
Reporting consistency for FOPO* accruals, 1995-2015

This table reports cross-sectional differences in reporting consistency for the 32 components of FOPO (FOPO*). Cons equals 1.0 if a firm reports nonzero FOPO* values in t, t-1 and t-2; 0.0 otherwise. AR_1 is the autoregressive slope as reported in Table 3. Pers. is the earnings persistence slope as reported in Table 5. AR_1 and Pers slopes that are not statistically different from 0.0 are italicized. Conditional probabilities represent the probability of reporting the same item in t+1 as in year t conditional on reporting it in years t-1, and t-2 ($R_{t+1}|C_t$) or the probability of reporting the same item in t+1 as in year t conditional on not reporting it in years t-1 and t-2 ($R_{t+1}|NC_t$). Diff is the average difference between ($R_{t+1}|C_t$) and ($R_{t+1}|NC_t$) and t-statistics are based on time-series variation in Diff over the 21 year sample.

FOPO*	Description	AR_1	Pers.	Cons.	$R_{t+1}\|C_t$	$R_{t+1}\|NC_t$	Diff	t-stat
1. Operating: Current								
Current Assets								
AR	AR provisions and allowances	0.680	0.785	0.752	0.781	0.639	0.142	19.36
Inv	Inv. provisions and allowances	0.317	*0.380*	0.608	0.748	0.573	0.174	10.02
Current Liabilities								
Wrnty	Warranty provisions	-	-	0.743	0.782	0.554	0.228	4.02
DefRev	Deferred revenue adjustments	*0.154*	*0.111*	0.651	0.654	0.592	0.062	1.78
2. Operating: Non Current								
Non-Current Assets								
WDTan	Tangible asset writedowns	0.143	0.141	0.362	0.611	0.363	0.248	12.74
WDIntan	Intangible asset writedowns	0.105	0.277	0.147	0.502	0.313	0.189	11.31
WDOth	Other/misc. writedowns	0.206	0.202	0.336	0.621	0.398	0.223	12.26
OthAst	Other/misc asset adjustments	0.321	0.542	0.651	0.622	0.447	0.176	6.75
Non-Current Liabilities								
Restr	Restructuring charges	0.123	-0.448	0.431	0.618	0.505	0.113	5.70
Legal	Enviromntl/Litigation charges	*-0.012*	*-0.153*	0.363	0.614	0.344	0.270	8.10
ARO	Asset retirement charges	-	-	0.565	0.726	0.538	0.174	1.88
NonStock	Deferred non-stock comp.	0.417	0.835	0.655	0.747	0.650	0.097	7.88
OthLiab	Other/misc liab. adjustments	0.269	0.637	0.543	0.394	0.299	0.095	2.54
3. Other								
Tax	Tax-related adjustments	*0.034*	0.355	0.553	0.676	0.413	0.263	13.27
Bargain	Gain on bargain purchase	-	-	0.042	0.300	0.122	0.189	1.14
OthGL	Other gains/losses	*0.060*	0.194	0.323	0.551	0.300	0.251	10.55
OthProv	Other provisions	0.328	*0.280*	0.640	0.727	0.488	0.239	10.52
Other	Other charges	0.357	*-0.229*	0.789	0.791	0.653	0.138	10.89
OpMisc	Miscellaneous/uncategorized	0.337	0.456	0.421	0.633	0.360	0.273	27.25
4.Financial								
Recurring div/interest								
Amort int.	Prem/disct amort; interest	0.480	0.504	0.525	0.635	0.580	0.056	5.43
Dividends	Dividends (non-cash)	-	-	0.487	0.595	0.354	0.241	2.85
Fair Value Adjustments								
DbtExt	Early debt extinguishment	0.107	*-0.252*	0.187	0.510	0.297	0.213	4.67
GLFI	Gain/loss on fin. instrument	0.159	*0.205*	0.333	0.559	0.373	0.186	5.58
FVAdj	Fair-value adjustment	*0.055*	*0.189*	0.385	0.588	0.530	0.058	2.81
WDFin	Fin. asset/liab. writedowns	0.178	0.481	0.209	0.433	0.306	0.127	2.50
Other								
Curr	Currency-related adjustments	*0.054*	*-0.480*	0.604	0.748	0.622	0.126	7.73
Cash	Restricted cash adjustments	-	-	0.459	0.308	0.234	0.123	1.41
FinMisc	Miscellaneous/uncategorized	*0.051*	0.268	0.517	0.607	0.536	0.071	2.64
5. Shareholders' Equity								
Compensation								
EmpStock	Stock-based comp – employee	0.613	0.854	0.664	0.775	0.703	0.072	7.63
TaxStock	Excess tax benefit; stock comp	0.428	1.092	0.595	0.763	0.684	0.079	4.96
Other								
OthStock	Expenses paid with stock	0.441	0.619	0.391	0.543	0.398	0.145	5.95
MI	Minority interest	0.511	0.753	0.547	0.582	0.505	0.077	2.18

Table 8
Earnings persistence regressions, conditioned on reporting consistency, 1995–2016

This table reports average slopes from annual cross-sectional regressions of future net income on operating cash flow and accrual components in year t. The t-statistics are based on the time-series variability of the slope estimates, incorporating a Newey-West correction with three lags to account for possible autocorrelation in the estimates. $FOPO^{GC}$ represents the sum of the consistently reported $FOPO^G$ components as defined below each panel. $FOPO^{GIC}$ are the accruals in that $FOPO^G$ group that are not reported in years t-1 and t-2. We require a firm's FOPO to be completely mapped in years t, t-1, and t-2. $OthAcc^*$ equals NI – CFO – $FOPO^{GC}$ – $FOPO^{GIC}$ – Dep – dWC. Other variables are defined in Table 2 and winsorized annually. The average number of firm-years per cross-section is 2,422.

Model: $NI_{t+1} = a_0 + a_1 CFO_t + a_2 FOPO^{GC}_t + a_3 FOPO^{GIC}_t + a_4 OthAcc^*_t + a_5 Dep_t + a_6 dWC_t + e_{t+1}$,

Panel A: $FOPO^G$ by function

		$FOPO^G$ Components						
		Operating				Financial	S/Equity	
	All (1)	**Current (2)**	**N/Current (3)**	**Other (4)**	**Total (5)**	**Total (6)**	***ex* TaxStk (7)**	**Total (8)**
CFO_t	0.921	0.930	0.929	0.930	0.928	0.926	0.898	0.897
t	(90.86)	(85.17)	(87.10)	(84.85)	(88.15)	(88.71)	(83.88)	(76.18)
$FOPO^{GC}_t$	0.623	0.650	0.274	0.778	0.522	0.314	1.062	1.087
t	(10.75)	(5.61)	(3.74)	(5.77)	(8.53)	(1.71)	(8.14)	(8.25)
$FOPO^{GIC}_t$	0.257	0.482	0.215	0.263	0.236	0.212	0.764	0.844
t	(13.67)	(3.07)	(7.55)	(3.67)	(10.11)	(1.82)	(8.86)	(9.37)
$OthAcc_t^*$	0.372	0.311	0.409	0.316	0.437	0.352	0.259	0.253
t	(8.97)	(12.83)	(14.45)	(17.31)	(10.40)	(11.64)	(12.38)	(12.55)
Dep_t	0.837	0.848	0.863	0.845	0.852	0.840	0.839	0.839
t	(20.94)	(21.17)	(21.28)	(20.64)	(21.24)	(22.37)	(21.42)	(22.10)
dWC_t	0.717	0.723	0.724	0.717	0.721	0.714	0.686	0.689
t	(15.90)	(14.91)	(15.79)	(14.97)	(15.17)	(15.09)	(17.09)	(17.48)
R^2	0.631	0.630	0.631	0.629	0.631	0.631	0.634	0.635
Tests for differences in coefficients								
$FOPO^{GC}$–$FOPO^{GIC}$	0.366	0.168	0.059	0.514	0.286	0.102	0.298	0.244
t	(5.85)	(1.21)	(0.82)	(3.69)	(5.00)	(0.58)	(1.77)	(1.49)
$FOPO^G$ – CFO	-0.299	-0.280	-0.655	-0.152	-0.406	-0.612	0.164	0.191
t	(-5.04)	(-2.41)	(-9.10)	(-1.15)	(-6.57)	(-3.37)	(1.22)	(1.41)
$FOPO^G$ – dWC	-0.095	-0.072	-0.450	0.061	-0.200	-0.399	0.376	0.399
t	(-1.18)	(-0.68)	(-5.72)	(0.44)	(-2.97)	(-1.93)	(2.53)	(2.70)

Note the accrual types include in regression models (2) through (8) are as follows:

<u>Operating</u>
Current (2): AR + Inv + Wrnty + DefRev
Non-Current (3): WDTan + WDIntan + WDOth + OthAst + Restr + Legal + ARO + NonStock + OthLiab
Other (4): Tax + Bargain + OthGL + OthProv + Other + OpMisc
Total (5): (2) + (3) + (4)

<u>Financial</u>
Total (6): Amort + Div + DbtExt + GLFI + FVAdj + WDFin + Curr + Cash + FinMisc

<u>Shareholders' Equity</u>
Ex Tax (7): EmpStock + OthStock + MI
Total (8): EmpStock + TaxStock + OthStock + MI

Table 8 - continued

Panel B: $FOPO^G$ by GAAP measurement principle

		$FOPO^G$ Components				
		Operating		Financial		Mixed
Model:	**All (1)**	**Matching (2)**	**Conservatism (3)**	**Matching (4)**	**Fair Value (5)**	**Total (6)**
CFO_t	0.921	0.903	0.929	0.929	0.925	0.930
t	(90.86)	(87.07)	(85.52)	(80.62)	(90.76)	(85.82)
$FOPO^{GC}_t$	0.623	0.955	0.234	0.360	0.135	0.504
t	(10.75)	(10.16)	(2.29)	(1.31)	(1.19)	(4.32)
$FOPO^{GIC}_t$	0.257	0.711	0.245	0.596	0.119	0.084
t	(13.67)	(11.62)	(8.48)	(3.08)	(0.69)	(1.72)
$OthAcc^*_t$	0.372	0.242	0.375	0.316	0.344	0.345
t	(8.97)	(9.56)	(15.60)	(15.32)	(12.76)	(16.93)
Dep_t	0.837	0.836	0.861	0.845	0.836	0.845
t	(20.94)	(21.55)	(21.92)	(20.00)	(23.94)	(20.43)
dWC_t	0.717	0.705	0.722	0.715	0.715	0.717
t	(15.90)	(17.14)	(15.48)	(14.88)	(14.91)	(14.92)
R^2	0.631	0.635	0.631	0.630	0.631	0.630
Tests for differences in coefficients						
$FOPO^{GC} – FOPO^{GIC}$	0.366	0.244	-0.011	-0.236	0.016	0.421
t	(5.85)	(2.05)	(-0.12)	(0.57)	(0.09)	(4.82)
$FOPO^G$ – CFO	-0.299	0.052	-0.695	-0.568	-0.790	-0.426
t	(-5.04)	(0.52)	(-6.92)	(-2.09)	(-6.75)	(-3.63)
$FOPO^G$ – dWC	-0.095	0.250	-0.488	-0.355	-0.580	-0.213
t	(-1.18)	(2.45)	(-5.76)	(-1.24)	(-4.25)	(-1.62)

Note the accrual types include in regression models (2) through (6) are as follows:
<u>Operating</u>
Matching (2): AR + NonStock + EmpStock + TaxStock + OthStock + MI + DefRev + Wrnty
Conservatism (3): Inv + WDTan + WDIntan + WDFin + WDOth + Legal
<u>Financial</u>
Matching (4): Amort + Div
Fair Value (5): GLFI + FVAdj + Curr + Cash
<u>Mixed Attributes</u>
Total (6): OthAst + Restr + ARO + OthLiab + OthProv + Tax + Other + OpMisc + OthGL + Bargain + DbtExt + FinMisc

Table 9
Earnings persistence for other FOPO*, conditioned on reporting consistency, 1995–2016

This table reports average slopes from annual cross-sectional regressions of future net income on operating cash flow and accrual components. The t-statistics are based on the time-series variability of the slope estimates, incorporating a Newey-West correction with three lags to account for possible autocorrelation in the estimates. We require FOPO* to be non-missing in at least 25 firms and at least 5 valid cross-sections. Consistency equals the percentage of consistently reported FOPO* items in year t. OthAcc* equals NI – CFO – FOPO* – Dep – dWC. Missing FOPO* values are set to zero. Other variables are defined in Table 2 and winsorized annually. The average cross-section has 2,422 observations.

Model: $NI_{t+1} = a_0 + a_1\, CFO_t + a_2\, FOPO^*_t + a_3\, Cons_t + a_4\, Cons \times FOPO^*_t + a_5\, OthAcc^*_t + a_6\, Dep_t + a_7\, dWC_t + e_{t+1}$,

			Differences		
			(FOPO* + FOPO* x Consistent) –		
FOPO*	**FOPO***	**FOPO* x Consistent**	**OthAcc***	**CFO**	**dWC**
OthAst	0.023	1.173	0.880	0.265	0.478
t	(0.07)	(2.04)	(1.65)	(0.50)	(0.91)
OthLiab	0.156	0.717	0.562	-0.058	0.145
t	(0.37)	(0.70)	(0.58)	(-0.06)	(0.15)
OthGL	0.280	-0.397	-0.435	-1.046	-0.833
t	(2.94)	(-1.95)	(-1.43)	(-3.43)	(-2.70)
OthProv	0.134	0.662	0.478	-0.134	0.080
t	(0.71)	(1.68)	(1.44)	(-0.41)	(0.25)
Other	-0.599	0.942	0.030	-0.582	-0.374
t	(-0.80)	(1.16)	(0.13)	(-2.47)	(-1.59)
OpMisc	0.200	0.632	0.518	-0.099	0.113
t	(1.81)	(4.22)	(4.81)	(-0.95)	(1.05)
FinMisc	-0.022	1.119	0.780	0.167	0.381
t	(-0.09)	(2.70)	(2.23)	(0.48)	(1.09)