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Bridging Theory and Empirical Research in Accounting

MATTHIAS BREUER,* EVA LABRO,† HARESH SAPRA,‡ AND ANASTASIA A. ZAKOLYUKINA‡

ABSTRACT

Formal theory and empirical research are complementary in building and advancing the body of knowledge in accounting in order to understand real-world phenomena. We offer thoughts on opportunities for empiricists and theorists to collaborate, build on each other's work, and iterate over models and data to make progress. For empiricists, we see room for more descriptive work, more experimental work on testing formal theories, and more work on quantifying theoretical parameters. For theorists, we see room for theories explicitly tied to descriptive evidence, new theories on individuals' decision making in a data-rich world, theories focused on accounting institutions and measurement issues, and richer theories for guiding empirical work and providing practical insights. We also encourage explicitly combining formal theory and empirical models by having both in one paper and by structural estimation.

JEL codes: C40, C50, C60, D60, M40

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1. *Introduction*

Since its inception, the *Journal of Accounting Research* (*JAR*) has striven to publish research that investigates fundamental accounting questions.

*Graduate School of Business, Columbia University; †Kenan-Flagler Business School, University of North Carolina; ‡Booth School of Business, University of Chicago

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Consequently, *JAR* editors have always believed that the journal must be receptive to all research methods that contribute to the body of knowledge. In particular, a long-standing tradition of the journal has been to encourage empirical research that is well grounded in theory and theoretical research that should speak to and be guided by empirical research.

The theme of the 2023 *JAR* conference was to reinforce the journal's commitment to publishing papers that strengthen the link between theoretical and empirical research in accounting. The conference included six such papers on the program, along with a panel discussion on how to better bridge theory and empirical research in accounting. In this piece, we discuss the main insights from the panel discussion. Our goal is to provide guidance and suggest steps that researchers can take to tighten the link between theory and empirical work. In doing so, we believe empiricists and theorists may learn and benefit from each other's work, which can help move the field forward toward a richer and more robust understanding of accounting and its institutions.[1]

In any rich research discipline, theory and empirical research are tightly linked. We believe the link between theory and empirical research should arguably be even tighter in accounting given that accountants typically study environments that are institutionally rich. This institutional richness provides opportunities for collaboration between theoretical and empirical researchers. However, it also poses important challenges. For example, it encourages specialization in particular institutions and methods, and it creates a disconnect between the rich observational data explored in most empirical work and the abstract models developed in most theory work. The specialization and apparent disconnect has made the research discipline methodologically siloed. This isolation, in turn, has hampered the development of frameworks for tackling fundamental accounting questions.

The cause of the methodological divide is easier to understand but harder to fix. Unfortunately, the divide is reinforced by the fact that most research institutions do not have any accounting theorists on their faculty. At some institutions, accounting PhD students might take theory courses taught by finance and economics faculty. However, such training is inadequate because accounting as a research discipline is not an extension of either finance or economics. Although many insights from related disciplines have been useful, theoretical models from either information economics or contract theory cannot simply be adapted to address fundamental accounting questions. This state has hurt the discipline in several ways. First, the dearth of accounting theorists implies empiricists and theorists do not sufficiently engage with each other and therefore do not benefit from each other's work. Empiricists complain that theorists develop models that have little practical relevance and are hard to test. Theorists

[1] Prior work has made similar points. For in-depth discussions, we refer interested readers to Bertomeu, Beyer, and Taylor [2016], Gow, Larcker, and Reiss [2016], Armstrong et al. [2022], Leuz [2022], Whited [2022], and Mahoney [2022].

complain empiricists do not read and therefore do not cite relevant theory work. Moreover, instead of having greater transparency and rigor in their empirical analyses to move beyond documenting partial correlations, some empiricists have resorted to employing either new data, new settings, or clever identification techniques that sometimes come at the cost of a weaker connection to theory. Second, and perhaps more importantly, many research institutions now hire PhD graduates based on the research methods that they employ rather than on their research agenda. Consequently, accounting PhD students decide very early in a PhD program that they want to specialize in a method rather than equipping themselves with all the necessary tools to develop a research agenda. Not surprisingly, given their labor market opportunities, many PhD students want to specialize in empirical methods further contributing to the dire shortage of accounting theorists.

In what follows, we offer guidance on how to foster a productive feedback loop between theory and empirical research, drawing on our experiences as readers, authors, and editors. We argue that theory and empirical research complement each other in generating a body of knowledge in accounting in section 2. In particular, we offer our thoughts on opportunities we see for empirical research to inform theory development and test theories in section 3.1, for theoretical research to build on and guide empirical work in section 3.2, and for research combining theory and empirics to produce a better understanding of important accounting phenomena and markets in section 3.3.

2. *The Promise of a Tight Connection*

Empirical research benefits from theory, just as theory benefits from empirical research. Empirical research describes the world (e.g., accounting practices and institutions). This description can be aided by theory. Theory, for example, can provide empiricists with orientation regarding which relations to study (i.e., the hypothesis-development section), how to design the study (i.e., the research-design section), and how to interpret the study's empirical findings (i.e., the interpretation or discussion section). The resulting empirical description of the world, in turn, can help refine extant theories and discard unsupported theories. This iterative process can ultimately lead to a better understanding of the world for the benefit of society. In this spirit, we view the use of various approaches, including empirical and theoretical work, as a means to collectively build and refine our understanding of fundamental questions in accounting.

The textbook example of a theoretically grounded empirical study is one that has a clear prediction derived from a relevant theory, one that can be tested using an experimental design that closely mirrors the theory at hand. As a case in point, consider theories on cheap talk and disclosure (e.g., Grossman and Hart [1980], Milgrom [1981], Crawford and Sobel [1982]). The qualitative and quantitative predictions of those theories have been tested using controlled experiments (e.g., Dickhaut et al. [2003],

Benndorf, Kübler, and Normann [2015], Fréchette, Lizzeri, and Perego [2022]). Such experiments have not only provided support for the theories' qualitative predictions, but also uncovered interesting deviations from their quantitative predictions, spurring the development of refined (behavioral) theories (e.g., Nagel [1995], Bosch-Domènech et al. [2002], Camerer, Ho, and Chong [2004], Crawford, Costa-Gomes, and Iriberri [2013], Fudenberg and Levine [2016]).[2]

The textbook example of an empirically grounded theoretical study starts with the theorists being intimately familiar with both the empirical accounting literature and accounting practice to understand what the core unanswered research questions are, where empirical puzzles exist, where empirical literature seems devoid of theory, and which broad set of facts describes the accounting phenomenon of interest. This knowledge allows the theorists to focus on a friction or tradeoff that is of empirical interest, while honing in on theoretical building blocks that are of first-order importance in understanding the relationship between an empirical independent and dependent variable. Gigler et al. [2009] is an example of such a theoretical study.[3] Motivated by a large empirical literature on the role of conservatism in debt contracting, Gigler et al. [2009] scrutinize a frequently offered explanation that timelier recognition of bad news increases debt contracting efficiency in the presence of shareholder-debtholder conflicts. They show that although conservatism can indeed result in timelier intervention by debtholders, it also generates false alarm costs that reduce debt contracting efficiency. Their formal equilibrium analysis illustrates that the common reasoning may be incomplete and that the mere existence of shareholder-debtholder conflicts is insufficient to generate a demand for conservatism. Rather, in evaluating the demand for accounting conservatism, the cost of false alarms produced by a conservative reporting system must be weighed against the benefits of timelier intervention.[4]

For a theoretical study to be empirically grounded, we believe variables should be precisely defined and the assumptions and timeline of the model setup should be clearly laid out so that empiricists are able to assess whether the model speaks to the research question they are trying to address empirically. Furthermore, the intuition behind derived results should be presented cogently, with the key forces and mechanisms highlighted, again facilitating empiricists' use of the theory. Starting a model from first-order, underresearched building blocks and working toward deriving insights

[2] Another case in point are theories of information aggregation in capital markets. Their qualitative and quantitative predictions have been studied extensively (e.g., Plott and Sunder [1988], Corgnet et al. [2023], Corgnet, DeSantis, and Porter [2024]).

[3] Throughout, we have chosen some of our own work as illustrative examples. This choice simply reflects our familiarity with the work, not that those examples are necessarily the only ones or even the best ones.

[4] Gigler et al also show how debt contracting efficiency is derived endogenously from the joint optimality of the debt covenant and the corresponding interest rate on debt and differs from the usual efficiency notion assumed in empirical studies.

into how these building blocks affect the dependent variables of interest increases the likelihood that the theory will produce new predictions for empiricists to tackle, relative to an approach where the starting point is a particular empirical phenomenon for which the theorist attempts to find a set of assumptions that allows rationalization of this phenomenon.

A tight connection and constructive feedback loop between theory and empirical research is appealing but often not achieved in accounting research practice. To be clear, a disconnect between empirical and theoretical studies is not uncommon in applied fields and accounting research is no exception in this regard. Given the applied nature of accounting research, we are inherently interested in the complex interactions of economic forces and real-world institutions, motivating our frequent use of observational data. These interactions are virtually impossible to synthesize in an elegant, abstract theory. The resulting gap between theory and empirical research thus cannot easily be bridged. Still, it can be accommodated and narrowed, and we provide some suggestions for ways to do so in the next section.

3. Opportunities

We next describe opportunities for a constructive feedback loop between theory and empirical research. We first discuss some opportunities for empirical research to aid theory development and test theories. We then discuss some opportunities for theory research to guide and build on empirical research. Those feedback loops can occur across empirical and theoretical studies but also within studies combining both approaches. We also describe some opportunities for combining the two approaches using structural estimation. We note that although we discuss opportunities in separate subsections reflecting the distinct perspectives for empirical, theoretical, and combined research, considerable overlap exists among these subsections. This overlap arises naturally due to the inherent feedback loop between theory and empirical research and reinforces the important point that both methodological approaches complement each other.

3.1 EMPIRICAL RESEARCH

We see several opportunities for empirical researchers to enhance the feedback loop between theory and empirical research. First and foremost, empirical research can greatly support and direct theory *development* by providing descriptive facts about important accounting phenomena and markets. Most empirical accounting research is descriptive in nature. That is, it does not use formal models to derive its specifications or interpret its inferences (Reiss [2011], Mahoney [2022]). Such research includes studies using causal-inference methods such as quasi-natural experiments. Those studies may allow an attribution of changes in outcomes to the changes in

the treatment of interest, often a regulatory change. However, they do not per se allow for a better theoretical understanding.[5]

We believe an open recognition of the descriptive nature of most empirical research in accounting helps both empirical and theoretical researchers. It frees empirical researchers from the perceived need to formulate explicit hypotheses and show surprising results (i.e., rejections of the null hypothesis).[6] The hypothesis-testing approach does not always provide the best fit for the realities faced by empirical accounting researchers who often rely on observational data—not controlled experiments—to loosely test predictions of abstract theories.[7] Given that observational data are generated by a myriad of economic forces and institutional particularities operating in the real world, a large gap often exists between the data used in empirical studies and the hypotheses purported to be tested. This gap creates unease about the relevance and rigor of empirical accounting research.

The recognition of the descriptive nature of most empirical accounting research opens up opportunities for a feedback loop between empirical and theory research *across* studies. Unlike hypothesis-testing studies, descriptive studies do not purport to start with a precise theory and conclusively test it. Instead, descriptive studies can focus on describing phenomena and markets of first-order interest and importance to an accounting audience (Gow, Larcker, and Reiss [2016]). Although facts assembled by descriptive studies alone do not provide deeper or generalizable insights, particularly robust and important facts can provide an input into theory development. For example, mounting descriptive evidence shows disclosure regulation appears to hurt some firms' competitive position and innovation incentives (e.g., Bernard [2016], Breuer [2021], Glaeser and Omartian [2022], Berger, Choi, and Tomar [2024]). Such robust evidence calls for the development of theoretical models to shed light on the implications of disclosure regulation on innovation incentives and its welfare implications.

The recognition of the descriptive nature of most empirical accounting research also lays bare its inherent limitations—and calls for theory. Descriptive evidence alone cannot speak to the overarching questions that

[5] Descriptive studies can, for example, inform on "what" is happening in capital markets in response to interventions (e.g., an accounting standard change) relevant to accounting researchers. But they are less well suited for answering deeper questions, such as "why" did market participants respond the way they did (i.e., generalizable reasons or mechanisms) and "so what" do the observed responses mean for the desirability of the intervention (i.e., welfare and regulatory implications).

[6] We risk "closing" literatures too early if we focus on the "surprise" criterion and extrapolate from vaguely related studies and settings. This way, we may fail to amass enough independent evidence to establish robust patterns worthy of new theory development.

[7] See, for example, Johnstone [2022], Ohlson [2023], Bertomeu [2023], Breuer [2023], Gow [2023], Kallapur [2023], and Teoh and Zhang [2023]. This approach can also result in an opportunistic use of theory research. Empirical papers can be tempted to cite different theories for each of their results. These disparate theories, however, are often inconsistent or incompatible.

often motivate our research, such as questions about regulatory implications and welfare (Leuz [2018], Ball [2024]). To seek answers to those questions, making assumptions is unavoidable. A tradeoff exists between the strength of assumptions and the strength of inferences that can be made about economic parameters, counterfactuals, and welfare (Mahoney [2022]). The need for assumptions and rigor should not dissuade us from asking big questions, including normative and accounting "design" questions (e.g., Barker et al. [2020], Penman [2023]). Instead, it should motivate us to engage in theory development. The development can take place in dedicated theory studies or, to ensure a particularly tight link between empirical and theory research, in studies combining both theory and empirics.

Besides aiding theory development, we see continued opportunities for empirical research to test and reject theories. Testing hypotheses and rejecting theories is important for making progress toward selecting a limited set of theories that appear useful for understanding accounting phenomena and markets. For this purpose, however, testing against a relevant null provided by a credible or prominent theory—rather than testing against a statistical null—is important (e.g., Ball [2013], Bertomeu [2023]). To credibly test the theory, we also need to closely approximate its main features and omissions with our research design. Controlled experiments, not observational data, typically provide the closest fit (e.g., Libby, Bloomfield, and Nelson [2002]). The experimental method is frequently used in neighboring fields such as game theory and information economics (e.g., Fudenberg et al. [2022], Fréchette, Lizzeri, and Perego [2022]) and holds substantial promise for testing extant, often abstract accounting theories. Quasi-experimental methods and related causal-inference methods can also be used to test theories (e.g., Gow, Larcker, and Reiss [2016], Armstrong et al. [2022], Leuz [2022]). Their benefit is that they allow testing not just the existence but also the importance of proposed theoretical links in practice. Often, however, the quasi-experimental variation does not closely conform to a particular theory. Thus, quasi-experimental studies typically provide descriptive evidence that does not directly test a theory but rather holds promise for theory development, as discussed above.

Finally, we also see room for empirical studies that explicitly quantify relevant model parameters and implications. The predictions and implications of theory models often depend on the set of plausible parameter values. Empirical research can help establish those values and inform on the theoretical implications (e.g., welfare effects). For this approach to work, however, theory needs to provide clear guidance regarding relevant parameters (e.g., audit-fee elasticity). In public economics, for example, theory has provided economic frameworks that clearly identify key parameters or sufficient statistics of interest (e.g., Andrews, Gentzkow, and Shapiro [2020a]) that allow inference of deeper, model-based insights but can be identified using familiar empirical methods such as linear regressions, instrumental variables, and discrete-choice models. Hendren and Sprung-Keyser [2020], for example, show how a few commonly estimated

statistics (e.g., causal estimates of regulatory changes) can be used to learn about welfare. In accounting, we may still need to develop such frameworks before they can productively guide empirical studies.

3.2 THEORY RESEARCH

We also see several opportunities for theoretical researchers to enhance the feedback loop between theory and empirical research. First, theory can aid the interpretation of descriptive empirical evidence. It can propose potential explanations derived from explicit assumptions about first-order building blocks. This approach can provide deeper insights into what the empirical evidence may mean (e.g., in terms of policy implications). It can also point out inferential ambiguities (e.g., two distinct theories providing the same observed outcomes), highlighting the limitations of the extant evidence and guiding the collection of new, more informative evidence. A key benefit of the theoretical approach in this regard is that, unlike empirical work, theory can focus on first-order forces and leave out of the model frictions and phenomena considered to be of lower level importance for the study at hand (Fischer [2016]).

As a prime example, consider the earnings management literature. The empiricist observes reported earnings only. To accurately measure earnings management, the empiricist must disentangle the piece in the observed earnings that is managed by the reporting firm or manager, because of strategic reasons or agency problems, and the true underlying economic fundamentals. To this end, Jones [1991] uses the residual of a regression that explains accruals to measure such discretionary accruals, whereas Burgstahler and Dichev [1997] use deviations from unimodal earnings distributions to capture such earnings management. A large empirical literature developed over decades, criticizing and refining these approaches (e.g., Dechow, Sloan, and Sweeney [1995], Durtschi and Easton [2005, 2009], Burgstahler and Chuk [2015]). In a model where the manager frequently uses information to improve decisions and subsequently reports it in a more aggregate fashion to the capital market, Hemmer and Labro [2019] shut down the earnings management channel by leaving any strategic disclosure or agency friction out of their model. They derive an earnings distribution that is not a unimodal distribution, yet reflects the well-documented "dip" at zero earnings that the literature hereto had attributed to earnings management. Although they do not suggest earnings management does not exist, this model implies the distributional methods used in the empirical literature are not accurately capturing this activity given they misspecify the "no earnings management benchmark."[8]

[8] Hemmer and Labro [2019] also include some descriptive initial evidence in their paper to pique the empiricists' interest for further exploration. For example, they show the empirical cash-flow distribution exhibits a stronger "dip" at zero than the empirical earnings distribution, even though cash-flow distributions by definition do not incorporate any accruals that can be managed.

Second, we see room and need for new theory development in emerging areas where data lead theory. The expansion of available data has allowed empiricists to describe at an ever-finer level how individuals make decisions. To interpret those data, new decision-making and behavioral theories seem necessary. To date, however, accounting theory has centered mostly on issues of information asymmetry such as in disclosure theory in financial accounting, with Verrecchia [1983] being the most highly cited accounting theory paper published in a top-three accounting journal, and agency theory (Holmström [1979]) in managerial accounting. These theories have undoubtedly spawned many further theoretical developments as well as empirical research and will continue to do so. However, room remains for the use of entirely new theoretical frameworks, especially those focused on single-agent pure decision-making problems and the role of properties of information therein.[9]

Speculatively, since the Blackwell Theorem established that more information is better in a *single* decision-maker setting, the opportunity for groundbreaking new insights or "man bites dog" predictions in this space may have seem limited to theorists compared to studying the role of information in settings with multiple decision-makers. However, unprecedented increases in data availability and processing capabilities (e.g., machine learning, predictive analytics, artificial intelligence) imply that the information environment has evolved substantially since the 1950s and continues to change more rapidly than before (Abis and Veldkamp [2024], Babina et al. [2024]).[10] This evolution creates new issues to consider in decision-making contexts, such as the interplay between the human decision-maker and the "machine" (e.g., Costello, Down, and Mehta [2020], Liu [2022]). It also leads to large information processing costs and information overload, which may make certain biases in information processing (e.g., rational inattention, fixation, anchoring, and salience) more prominent and important to be theoretically modeled (e.g., Eppler and Mengis [2004]). The "more or less" characterization of information in decision making and the "more or less asymmetric" characterization of information in disclosure and agency theories may no longer be a sufficient approach for modeling the modern information environment. Additionally, we can look into other characteristics of information that are practically and empirically relevant, such as the level of aggregation, the ease of communication and transmission (Garicano [2000]), the frequency of information provision (Gigler and Hemmer [1998]) (in the limit going

[9] The theories on investment under uncertainty (Dixit and Pindyck [1994]) are closest to this objective but center solely on a particular type of decision (investment) and are ranked a distant third in terms of popularity in accounting research. The theories on delegation of decision making center on who gets to make the decisions and are embedded in an agency context with multiple players, where information asymmetry again plays the most important role. A self-serving exception is Hemmer and Labro [2019].

[10] The amount of data created, captured, copied, and consumed worldwide increased from 2 zettabytes in 2012 to 118 zettabytes in 2023 (Taylor [2023]).

to instantaneous), whether the information is structured or unstructured, and whether it is soft or hard (Bertomeu and Marinovic [2016]). Lastly, information system designers may need to consider tradeoffs between the various characteristics of information. For example, highly disaggregate information may be difficult to transmit frequently.

Third, we believe that what makes accounting distinct as an institution and research discipline is that it takes measurement issues seriously (see, e.g., Kanodia and Sapra [2016]). Studying accounting through the measurement lens allows us to better understand and inform the institutional design of accounting practice. The multiple banking crises of recent years, for example, have underscored the importance of both mark-to-market accounting and loan loss provisioning on bank stability—issues that have broader ramifications for the economy and that nonaccounting researchers have unfortunately ignored. For example, Plantin, Sapra, and Shin [2008] show the tradeoffs between the choices between historical cost versus mark-to-market accounting are far from one sided, and Mahieux, Sapra, and Zhang [2023] study how the provisioning models (incurred loss versus expected loss models) interact with bank regulation to affect banks' risk-taking behavior. Recently, concerns about climate risks illustrate the important role that accounting scholars should play in climate-related disclosures. Stakeholder capitalism suggests the need to measure multiple firm-performance metrics beyond shareholder returns, which can result in difficult multitasking concerns (e.g., Bushman [2022]). Furthermore, in management accounting, measurement choices shape incentives (e.g., Bonham [2024]). Shedding light on fundamental questions through rigorous modeling of relevant measurement issues and institutional details can be an important avenue for accounting theory to guide and interpret empirical research and inform policy and practice.

Finally, theorists can also develop richer theories or "big models" that account for various, first-order economic forces with the goal of providing useful, practical predictions.[11] Such models are, for example, developed and used in fields such as macroeconomics and earth-systems modeling, where the models are supposed to aid real-world decision making (e.g., Christiano, Trabandt, and Walentin [2010], Rao et al. [2010], Gettelman et al. [2022]).[12] Those models should be informed by extant empirical research (e.g., which forces to include and which parameter values to

[11] Dynamic investment models, for example, could provide a useful base model or primitive for corporate behavior (e.g., Breuer and Windisch [2019]) that can be expanded to incorporate various frictions (e.g., agency issues) and managerial choices (e.g., financing and reporting) (e.g., Strebulaev and Whited [2012], Terry, Whited, and Zakolyukina [2023], Terry [2023]).

[12] As an applied field, accounting research may also benefit from expanding its approach to research by embracing an engineering approach. Such an engineering approach would emphasize the practical usefulness of predictions derived from theories and models (not necessarily their elegance, the reasonableness of their assumptions, or the distance of predictions from the assumptions), in the spirit of the aphorism that "all models are wrong" (Box [1976]) but some models are useful.

choose) and can help guide researchers toward relevant parameters or sufficient statistics to identify in the data (e.g., in the spirit of Andrews, Gentzkow, and Shapiro [2020a]). Those models would seem particularly relevant given that many existing capital-market–focused frameworks (e.g., pure exchange models) and extant empirical measures (e.g., value relevance) are of limited relevance to answering broader questions (e.g., the welfare effects of accounting as in Ball [2024]). Because capital is just one of many factors used in the economy and investor value is not the ultimate welfare criterion, it seems an important avenue for theory to develop a richer, macroeconomic framework that allows understanding of the broader role of accounting. Stated differently, accounting has all the attributes of an area of public policy, intimately linked to financial regulation and the conduct of macroeconomic policy. We still do not know a lot about the role financial accounting plays in the economy, and we, as accounting researchers, have much to contribute to these policy debates.

3.3 COMBINED RESEARCH

We have discussed how theory and empirical researchers can engage in a productive feedback loop and build on each other's work. In addition, two avenues to a closer combination of formal theory and empirics are possible. One is to have formal theory and empirical models in one paper and another is to impose an even tighter link through structural estimation.

3.3.1. Formal Theory and Empirical Models in One Paper. We see potential opportunities for research combining formal theory and empirics in one paper. Combined research can start with descriptive evidence and develop a setting-specific formal theoretical framework to gain better understanding of the evidence, or develop a formal theoretical model and assess its fit to the data, such as by testing key hypotheses.[13] Either way, combined research represents what Mahoney [2022] calls model-based research. It allows empirical research to move beyond partial correlations and descriptive facts and permits theory research to go beyond presenting "possibility" results. Neither part alone—theory or empirics—needs to constitute a separate contribution. The explicit combination is justified by the fact that either alone would not be particularly informative. Given the inherent limitations of descriptive evidence, we should not require a high bar for empirical studies to include formal theory. Formal theory can help provide at least one plausible explanation, using rigorous thought and transparent assumptions. Such theory disciplines the researchers and helps readers to think about the problem. Preferably, the formal theory should be one of the most plausible explanations, if not the most plausible one. Still, it does not

[13] Several of the papers in the 2023 *JAR* conference fall into the category of combined research. Cheynel, Cianciaruso, and Zhou [2024], for example, start by documenting a descriptive fact that they subsequently explain and interpret using a formal model. Bloomfield, Heinle, and Timmermans [2024], Kim [2024], and Raghunandan and Ruchti [2024], by contrast, start with formal models that provide predictions that they test in the data.

need to be the only explanation, as long as proper discussion is provided. We see substantial room for more model-based research. Many descriptive accounting studies, for example, can take an additional step toward a better understanding of empirical facts, by offering a simple yet rigorously and transparently derived explanation for these facts in a discussion section *after* presenting them. This section would substitute for the often post hoc and loose derivation of hypotheses presented before describing the facts.

Although combining formal theory and empirical models—either by having both in one paper or by structural estimation—makes theory underlying empirical analyses transparent, it does not on its own ensure the model captures the process that generated the data. Gow, Larcker, and Reiss [2016, p. 516] caution that "just because a researcher can write down a theoretical model and estimate it does not make the empirical model 'right."' The assumptions underlying a formal model have to be evaluated on how well they capture practical realities of the question being studied. Relatedly, the "blank sheet of paper" approach to bringing formal theory models into empirical papers can be dangerous. If each paper builds its own model from scratch, the field may end up with a myriad of models that do not relate to each other and obscure meaningful patterns in the data. We are yet to see if any models of, say, accounting discretion or disclosure are rich enough to be refined over time to better explain the data. One example of a gradual refinement of models is the consumption-based asset-pricing literature in finance, which seeks to solve the equity premium puzzle (Mehra and Prescott [1985]).

A transition toward more model-based empirical research requires gradual changes, new collaborations, and continued support through the review process and PhD training. Empirical researchers can be reluctant to incorporate formal theory into an empirical paper, either because they have limited experience with formal theory or because they expect the theory to be discarded in the review process.[14] Indeed, the review process can be a challenge for these papers because they can lack "deep theoretical insight" for a theory reviewer and can be "too stylized" for an empirical reviewer. Limited experience can be overcome by collaboration with theorists, whereas the disappointing review process can be avoided by a clear commitment and support of reviewers and editors. Over time, as more empirical studies use formal models, common building blocks and modeling approaches are likely to emerge. These elements, in turn, would allow readers to be more open to formal theory, empirical researchers to become more confident in using formal theory, and theory researchers to assess pervasive data patterns to focus on refining formal theory.

3.3.2. The Role of Structural Estimation. Structural estimation is the ultimate bridge between theory and empirical work. It takes formal

[14] Opportunities exist for PhD students who do not have access to theory classes to take courses, such as those offered by the *Accounting and Economics Society* and the Duke Theory Summer School.

mathematical models to data directly, which enables tighter empirical conclusions about economic constructs of interest than descriptive or experimental work. These models may specify a manager's preferences, a production function, investors' information set, and some notion of a pricing equilibrium. Using data, a researcher estimates the model's parameters, assesses the model's fit, and uses the estimated model in evaluating counterfactual experiments. This approach may require solving the model numerically or imposing model-based restrictions in some other way using standard econometrics.

By writing down the model that a researcher believes has created the data up to an error, the researcher can address certain types of research questions that are otherwise difficult or impossible to tackle: (1) learning the economic primitives, such as the rate at which the cost of misstating earnings increases in the size of misstatement or the persistence of capital productivity; (2) backing out important unobservables, that is, values known by managers or investors but not directly observable in the data, such as the size of undetected misstatements or the underlying amount of economic uncertainty; and (3) conducting counterfactual analyses, that is, to explore what would happen if some fundamental element of the model changed, such as the effect of substantially greater audit industry concentration or prohibition of non-GAAP disclosures. Estimating the model and inverting the data back through the lens of the model deliver the model's parameters, the variables that are otherwise not directly observable, and an ability to study counterfactual changes, which could happen but have not yet, so would need to be simulated with a model. To illustrate features of structural estimation, we compare it with descriptive regressions using three studies by Gerakos and Syverson [2015], Bertomeu et al. [2022], and Terry, Whited, and Zakolyukina [2023].

Gerakos and Syverson [2015] evaluate mandatory audit-firm rotation and the reduction in the supply of audit services from the exit of a "Big 4" firm—both concerns for policy makers—using a model of competition in the audit market. The paper estimates a discrete-choice demand model for quantifying changes in consumer surplus. This model requires an estimate of a firm's sensitivity to audit fees, which is identified using the fee variation driven by a supply-side shifter—an unexpected exit of Arthur Andersen. The approach the paper uses differs from the audit-fee regressions common in the literature, in which the audit fees are regressed on firm characteristics such as size, foreign sales, and litigation risk. As Gerakos and Syverson [2017] discuss in detail, the coefficients from these regressions cannot be interpreted as coming from demand or supply alone. The fundamental problem is that audit fees are an equilibrium outcome that reflects both demand and supply effects. To separate these effects, one needs a variable that, say, shifts the supply but not demand and thus traces out just the demand curve as Gerakos and Syverson [2015] do using the exit of Arthur Andersen. Without separating demand-side factors in the model that imposes the structure necessary for evaluation of consumer

surplus, quantifying the costs of mandatory rotation and an exit of a "Big 4" firm in Gerakos and Syverson [2015] would be impossible.[15]

Bertomeu et al. [2022] evaluate earnings forecast disclosures using a dynamic model in which managers can conceal information from investors. The paper finds the strategic reporting when managers hide the bad news is widespread and economically significant. Managers build a reputation for nondisclosure, creating a time-varying threshold for nondisclosure that depends on their past disclosure decisions. By creating this reputation, forward-looking managers avoid strong decreases in future prices. Because managers' information is private and thus unobserved, using a descriptive regression to differentiate between an uninformed manager and an informed manager is difficult. In this case, structural estimation allows the issue of unobservables to be addressed by estimating the latent processes for earnings, the arrival of managers' private information, and the wedge in the precision of managers' and outside analysts' information.

Terry, Whited, and Zakolyukina [2023] quantify a tradeoff between real and accrual earnings management in the context of intangible capital. The paper estimates a socially optimal level of disclosure regulation exceeding the estimated value, with complete elimination of earnings misreporting having modest effects on social welfare and aggregate growth. Prior research has studied this tradeoff using statistical models with both real and accrual discretion captured by the models' residuals. Even if these residuals measure discretion accurately, the regression coefficients sill have no economic content (but they do have a statistical one). The lack of economic content makes using these measures to study counterfactual questions in which firms re-optimize their behavior difficult. For instance, a researcher does not observe an environment in which earnings misreporting is nonexistent or, in the language of descriptive analyses, we cannot turn an indicator variable for the absence of misreporting on or off to evaluate the change in real earnings management in a descriptive study; by contrast, structural work can study these questions.

The increase in the breadth and depth of studies using structural estimation being published in leading accounting journals in recent years is encouraging.[16] Expanding training opportunities for PhD students and faculty aids progress.[17]

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[15] As in Gerakos and Syverson [2015], exogenous variation is sometimes necessary for the estimation of structural models. This variation, for example, can provide relevant moments or parameter inputs (for more detail, see, e.g., Kahn and Whited [2018], Andrews, Gentzkow, and Shapiro [2020a~~],~~,2020b]).

[16] Gow, Larcker, and Reiss [2016] and Bertomeu, Liang, and Marinovic [2023] discuss much of this research. A number of dissertations do structural estimation, for example, Zakolyukina [2018], Zhou [2021], Choi [2021], McClure [2023], Li [2023], Liang [2020], Kim [2020], Huber [2021], and Yang [2024]. The nonexhaustive list also includes Gerakos and Kovrijnykh [2013], Beyer, Guttman, and Marinovic [2019], Breuer and Windisch [2019], Gayle, Li, and Miller [2022], Bertomeu et al. [2021], and McClure and Zakolyukina [2024].

[17] Toni Whited and Luke Taylor and the *Accounting and Economics Society* organize popular summer schools on structural estimation.

4. Conclusion

We have argued that the complementary use of formal theory and empirical research in accounting not only allows for a better understanding of accounting and its institutions but is crucial for advancing the body of accounting knowledge. We offer thoughts on opportunities for empiricists and theorists to strengthen the link between theory and empirical research to create a virtuous feedback loop between models and data. For empiricists, we see room for more descriptive work on important accounting phenomena and markets, more experimental work to tightly test theories' hypotheses, and more work focused on quantifying relevant theoretical parameters. For theorists, in turn, we see room for theories explicitly motivated and informed by extant descriptive evidence, new theories on individuals' decision making in a world with burgeoning data, and theories focused on the institutional particularities of accounting that take measurement issues seriously. We also encourage carefully combining formal theory and empirical models in one paper with the formal theory tailored to a specific empirical setting. Such combined research can range from empirical studies adding stylized models to formally advance plausible explanations for the partial correlations to studies developing full-blown structural models taken, in their entirety, to the data.

Overall, we call for a more collaborative approach to research across methodological silos. In this regard, we think that empiricists and theorists should highlight similarities across studies more clearly instead of solely or primarily emphasizing differences between studies with the goal to establish a study's novelty. Such emphasis will help develop a set of relevant theoretical building blocks and robust empirical facts for future research to build on. We believe that *JAR* and other accounting journals play an important role in encouraging and enabling such developments.

REFERENCES

Abis, S., and L. Veldkamp. "The Changing Economics of Knowledge Production." *Review of Financial Studies* 37 (2024): 89–118.

Andrews, I.; M. Gentzkow; and J. M. Shapiro. "On the Informativeness of Descriptive Statistics for Structural Estimates." *Econometrica* 88 (2020a): 2231–58.

Andrews, I.; M. Gentzkow; and J. M. Shapiro. "Transparency in Structural Research." *Journal of Business & Economic Statistics* 38 (2020b): 711–22. https://doi.org/10.1080/07350015.2020.1796395.

Armstrong, C.; J. D. Kepler; D. Samuels; and D. Taylor. "Causality Redux: The Evolution of Empirical Methods in Accounting Research and the Growth of Quasi-Experiments." *Journal of Accounting and Economics* 74 (2022). ISSN 0165-4101. https://doi.org/10.1016/j.jacceco.2022.101521.

Babina, T.; A. Fedyk; A. He; and J. Hodson. "Artificial Intelligence, Firm Growth, and Product Innovation." *Journal of Financial Economics* 151 (2024): 1–26.

Ball, R. "Accounting Informs Investors and Earnings Management Is Rife: Two Questionable Beliefs." *Accounting Horizons* 27 (2013): 847–53. ISSN 0888-7993. 10.2308/acch-10366.

Ball, R. "By What Criteria Do We Evaluate Accounting? Some Thoughts on Economic Welfare and the Archival Literature." *Journal of Accounting Research* 62 (2024): 7–54.

Barker, R.; S. Penman; T. J. Linsmeier; and S. Cooper. "Moving the Conceptual Framework Forward: Accounting for Uncertainty." *Contemporary Accounting Research* 37 (2020): 322–57. https://doi.org/10.1111/1911-3846.12585.

Benndorf, V.; D. Kübler; and H.-T. Normann. "Privacy Concerns, Voluntary Disclosure of Information, and Unraveling: An Experiment." *European Economic Review* 75 (2015): 43–59. ISSN 0014-2921. https://doi.org/10.1016/j.euroecorev.2015.01.005.

Berger, P. G.; J. H. Choi; and S. Tomar. "Breaking it Down: Economic Consequences of Disaggregated Cost Disclosures." *Management Science* 70 (2024): 1374–93.

Bernard, D. "Is the Risk of Product Market Predation a Cost of Disclosure?" *Journal of Accounting and Economics* 62 (2016): 305–25. ISSN 0165-4101. https://doi.org/10.1016/j.jacceco.2016.07.001.

Bertomeu, J. "Statistical versus Economic Significance in Accounting: A Reality Check." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2023-0002.

Bertomeu, J.; A. Beyer; and D. J. Taylor. "From Casual to Causal Inference in Accounting Research: The Need for Theoretical Foundations." *Foundations and Trends in Accounting* 10 (2016): 262–313.

Bertomeu, J.; E. Cheynel; E. X. Li; and Y. Liang. "How Pervasive Is Earnings Management? Evidence from a Structural Model." *Management Science* 67 (2021): 5145–62.

Bertomeu, J.; Y. Liang; and I. Marinovic. "A Primer on Structural Estimation in Accounting Research." *Foundations and Trends in Accounting* 18 (2023): 1–137.

Bertomeu, J., and I. Marinovic. "A Theory of Hard and Soft Information." *The Accounting Review* 91 (2016): 1–20.

Bertomeu, J.; I. Marinovic; S. J. Terry; and F. Varas. "The Dynamics of Concealment." *Journal of Financial Economics* 143 (2022): 227–46.

Beyer, A.; I. Guttman; and I. Marinovic. "Earnings Management and Earnings Quality: Theory and Evidence." *The Accounting Review* 94 (2019): 77–101.

Bloomfield, M. J.; M. Heinle; and O. Timmermans. "Relative Performance Evaluation and Strategic Peer-Harming Disclosures." *Journal of Accounting Research* (2024): Forthcoming.

Bonham, J. D. "Shaping Incentives Through Measurement and Contracts." *The Accounting Review* (2024): Forthcoming. https://doi.org/10.2308/TAR-2019-0248.

Bosch-Domènech, A.; J. G. Montalvo; R. Nagel; and A. Satorra. "One, Two, (Three), Infinity,…: Newspaper and Lab Beauty-Contest Experiments." *American Economic Review* 92 (2002): 1687–701. ISSN 00028282.

Box, G. E. P. "Science and Statistics." *Journal of the American Statistical Association* 71 (1976): 791–99. ISSN 01621459.

Breuer, M. "How Does Financial-Reporting Regulation Affect Industry-Wide Resource Allocation?" *Journal of Accounting Research* 59 (2021): 59–110. https://doi.org/10.1111/1475-679X.12345.

Breuer, M. "Another Way Forward: Comments on Ohlson's Critique of Empirical Accounting Research." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2022-0093.

Breuer, M., and D. Windisch. "Investment Dynamics and Earnings-Return Properties: A Structural Approach." *Journal of Accounting Research* 57 (2019): 639–74.

Burgstahler, D., and E. Chuk. "Do Scaling and Selection Explain Earnings Discontinuities?" *Journal of Accounting and Economics* 60 (2015): 168–86.

Burgstahler, D., and I. Dichev. "Earnings Management to Avoid Earnings Decreases and Losses." *Journal of Accounting and Economics* 24 (1997): 99–126.

Bushman, R. "ESG Measurement: A Surprisingly Complex Issue." 2022. Available at https://kenaninstitute.unc.edu/kenan-insight/esg-measurement-a-surprisingly-complex-issue/.

Camerer, C. F.; T.-H. Ho; and J.-K. Chong. "A Cognitive Hierarchy Model of Games." *Quarterly Journal of Economics* 119 (2004): 861–98. ISSN 00335533, 15314650.

Cheynel, E.; D. Cianciaruso; and F. S. Zhou. "Fraud Power Laws." *Journal of Accounting Research* (2024): Forthcoming.

Choi, J. H. "Accrual Accounting and Resource Allocation: A General Equilibrium Analysis." *Journal of Accounting Research* 59 (2021): 1179–219.

Christiano, L. J.; M. Trabandt; and K. Walentin. "DSGE Models for Monetary Policy Analysis," in *Handbook of Monetary Economics*, edited by B. M. Friedman and M. Woodford, Volume 3. San Diego, CA: Elsevier, 2010: 285–367. https://doi.org/10.1016/B978-0-444-53238-1.00007-7.

Corgnet, B.; C. Deck; M. DeSantis; K. Hampton; and E. O. Kimbrough. "When Do Security Markets Aggregate Dispersed Information?" *Management Science* 69 (2023): 3697–729.

Corgnet, B.; M. DeSantis; and D. Porter. "Let's Chat… When Communication Promotes Efficiency in Experimental Asset Markets." *Management Science* (2024): Forthcoming.

Costello, A. M.; A. K. Down; and M. N. Mehta. "Machine + Man: A Field Experiment on the Role of Discretion in Augmenting AI-Based Lending Models." *Journal of Accounting and Economics* 70 (2020). ISSN 0165-4101, 101360.

Crawford, V. P.; M. A. Costa-Gomes; and N. Iriberri. "Structural Models of Nonequilibrium Strategic Thinking: Theory, Evidence, and Applications." *Journal of Economic Literature* 51 (2013): 5–62. 10.1257/jel.51.1.5.

Crawford, V. P., and J. Sobel. "Strategic Information Transmission." *Econometrica* 50 (1982): 1431–51. ISSN 00129682, 14680262.

Dechow, P. M.; R. G. Sloan; and A. P. Sweeney. "Detecting Earnings Management." *The Accounting Review* 70 (1995): 193–225.

Dickhaut, J.; M. Ledyard; A. Mukherji; and H. Sapra. "Information Management and Valuation: An Experimental Investigation." *Games and Economic Behavior* 44 (2003): 26–53. ISSN 0899-8256.

Dixit, A. K., and R. S. Pindyck. *Investment Under Uncertainty*. Princeton, NJ: Princeton University Press, 1994.

Durtschi, C., and P. Easton. "Earnings Management? The Shapes of the Frequency Distributions of Earnings Metrics Are Not Evidence Ipso Facto." *Journal of Accounting Research* 43 (2005): 557–92.

Durtschi, C., and P. Easton. "Earnings Management? Erroneous Inferences Based on Earnings Frequency Distributions." *Journal of Accounting Research* 47 (2009): 1249–81.

Eppler, M. J., and J. Mengis. "The Concept of Information Overload: A Review of Literature from Organization Science, Accounting, Marketing, MIS, and Related Disciplines." *The Information Society* 20 (2004): 325–44. 10.1080/01972240490507974.

Fischer, P. "Plenary Talk at 12th EIASM Workshop on Accounting and Economics, Tilburg, the Netherlands." Wharton, University of Pennsylvania, 2016.

Fréchette, G. R.; A. Lizzeri; and J. Perego. "Rules and Commitment in Communication: An Experimental Analysis." *Econometrica* 90 (2022): 2283–318. https://doi.org/10.3982/ECTA18585.

Fudenberg, D.; J. Kleinberg; A. Liang; and S. Mullainathan. "Measuring the Completeness of Economic Models." *Journal of Political Economy* 130 (2022): 956–90. 10.1086/718371.

Fudenberg, D., and D. K. Levine. "Whither Game Theory? Towards a Theory of Learning in Games." *Journal of Economic Perspectives* 30 (2016): 151–70. 10.1257/jep.30.4.151.

Garicano, L. "Hierarchies and the Organization of Knowledge in Production." *Journal of Political Economy* 108 (2000): 874–904.

Gayle, G.-L.; C. Li; and R. Miller. "Was Sarbanes-Oxley Costly? Evidence from Optimal Contracting on CEO Compensation." *Journal of Accounting Research* 60 (2022): 1189–234.

Gerakos, J., and A. Kovrijnykh. "Performance Shocks and Misreporting." *Journal of Accounting and Economics* 56 (2013): 57–72.

Gerakos, J., and C. Syverson. "Competition in the Audit Market: Policy Implications." *Journal of Accounting Research* 53 (2015): 725–75.

Gerakos, J., and C. Syverson. "Audit Firms Face Downward-Sloping Demand Curves and the Audit Market Is Far from Perfectly Competitive." *Review of Accounting Studies* 22 (2017): 1582–94.

Gettelman, A.; A. J. Geer; R. M. Forbes; G. R. Carmichael; G. Feingold; D. J. Posselt; G. L. Stephens; S. C. van den Heever; A. C. Varble; and P. Zuidema. "The Future of Earth

System Prediction: Advances in Model-Data Fusion." *Science Advances* 8 (2022): eabn3488. 10.1126/sciadv.abn3488.

Gigler, F., and T. Hemmer. "On the Frequency, Quality, and Informational Role of Mandatory Financial Reports." *Journal of Accounting Research* 36 (1998): 117–47.

Gigler, F.; C. Kanodia; H. Sapra; and R. Venugopalan. "Accounting Conservatism and the Efficiency of Debt Contracts." *Journal of Accounting Research* 47 (2009): 767–97. https://doi.org/10.1111/j.1475-679X.2009.00336.x.

Glaeser, S., and J. D. Omartian. "Public Firm Presence, Financial Reporting, and the Decline of U.S. Manufacturing." *Journal of Accounting Research* 60 (2022): 1085–130. https://doi.org/10.1111/1475-679X.12411.

Gow, I. D. "The Elephant in the Room: p-Hacking and Accounting Research." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2022-0111.

Gow, I. D.; D. F. Larcker; and P. C. Reiss. "Causal Inference in Accounting Research." *Journal of Accounting Research* 54 (2016): 477–523.

Grossman, S. J., and O. D. Hart. "Disclosure Laws and Takeover Bids." *Journal of Finance* 35 (1980): 323–34. ISSN 00221082, 15406261.

Hemmer, T., and E. Labro. "Management by the Numbers: A Formal Approach to Deriving Informational and Distributional Properties of 'Unmanaged' Earnings." *Journal of Accounting Research* 57 (2019): 5–51.

Hendren, N., and B. Sprung-Keyser. "A Unified Welfare Analysis of Government Policies." *Quarterly Journal of Economics* 135 (2020): 1209–318.

Holmström, B. "Moral Hazard and Observability." *Bell Journal of Economics* 10 (1979): 74–91.

Huber, S. J. "Loan Loss Measurement and Bank Lending." Working paper, Stanford University, 2021.

Johnstone, D. "Accounting Research and the Significance Test Crisis." *Critical Perspectives on Accounting* 89 (2022), 102296.

Jones, J. J. "Earnings Management During Import Relief Investigations." *Journal of Accounting Research* 29 (1991): 193–228.

Kahn, R., and T. M. Whited. "Identification Is Not Causality, and Vice Versa." *Review of Corporate Finance Studies* 7 (2018): 1–21.

Kallapur, S. "Accounting Research as Bayesian Inference to the Best Explanation." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2021-0083.

Kanodia, C., and H. Sapra. "A Real Effects Perspective to Accounting Measurement and Disclosure: Implications and Insights for Future Research." *Journal of Accounting Research* 54 (2016): 623–76. https://doi.org/10.1111/1475-679X.12109.

Kim, C. "Spillover Effects of Financial Reporting on Public Firms' Corporate Investment." Working paper, University of Pennsylvania, 2020.

Kim, J. M. "Economics of Information Search and Financial Misreporting." *Journal of Accounting Research* (2024): Forthcoming.

Leuz, C. "Evidence-Based Policymaking: Promise, Challenges and Opportunities for Accounting and Financial Markets Research." *Accounting and Business Research* 48 (2018): 582–608. 10.1080/00014788.2018.1470151.

Leuz, C. "Towards a Design-Based Approach to Accounting Research." *Journal of Accounting and Economics* 74 (2022), 101550

Li, C. "Are Top Management Teams Compensated as Teams? A Structural Modeling Approach." *Management Science* (2023): Forthcoming.

Liang, Y. "How Much Does Imprecision in Accounting Measurement Enhance Value?" Working paper, The City University of New York, 2020.

Libby, R.; R. Bloomfield; and M. W. Nelson. "Experimental Research in Financial Accounting." *Accounting, Organizations and Society* 27 (2002): 775–810. ISSN 0361-3682. https://doi.org/10.1016/S0361-3682(01)00011-3.

Liu, M. "Assessing Human Information Processing in Lending Decisions: A Machine Learning Approach." *Journal of Accounting Research* 60 (2022): 607–51.

MAHIEUX, L.; H. SAPRA; and G. ZHANG. "CECL: Timely Loan Loss Provisioning and Bank Regulation." *Journal of Accounting Research* 61 (2023): 3–46.

MAHONEY, N. "Principles for Combining Descriptive and Model-Based Analysis in Applied Microeconomics Research." *Journal of Economic Perspectives* 36 (2022): 211–22.

MCCLURE, C. "How Costly Is Tax Avoidance? Evidence from Structural Estimation." *The Accounting Review* 98 (2023): 353–80.

MCCLURE, C., and A. A. ZAKOLYUKINA. "Non-GAAP Reporting and Investment." *The Accounting Review* 99 (2024): 341–67.

MEHRA, R., and E. C. PRESCOTT. "The Equity Premium: A Puzzle." *Journal of Monetary Economics* 15 (1985): 145–61.

MILGROM, P. R. "Good News and Bad News: Representation Theorems and Applications." *Bell Journal of Economics* 12 (1981): 380–91. ISSN 0361915X.

NAGEL, R. "Unraveling in Guessing Games: An Experimental Study." *American Economic Review* 85 (1995): 1313–26. ISSN 00028282.

OHLSON, J. A. "Empirical Accounting Seminars: Elephants in the Room." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2021-0067.

PENMAN, S. "Accounting for Uncertainty." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2022-0059.

PLANTIN, G.; H. SAPRA; and H. S. SHIN. "Marking-to-Market: Panacea or Pandora's Box?" *Journal of Accounting Research* 46 (2008): 435–60.

PLOTT, C. R., and S. SUNDER. "Rational Expectations and the Aggregation of Diverse Information in Laboratory Security Markets." *Econometrica* 56 (1988): 1085–118. ISSN 00129682, 14680262.

RAGHUNANDAN, A., and T. RUCHTI. "The Impact of Information Frictions Within Regulators: Evidence from Workplace Safety Violations." *Journal of Accounting Research* (2024): Forthcoming.

RAO, K.; A. M. SBORDONE; A. TAMBALOTTI; and K. WALSH. "Policy Analysis Using DSGE Models: An Introduction." *Economic Policy Review* 16 (2010): 23–43.

REISS, P. C. "Structural Workshop Paper—Descriptive, Structural, and Experimental Empirical Methods in Marketing Research." *Marketing Science* 30 (2011): 950–64.

STREBULAEV, I. A., and T. M. WHITED. "Dynamic Models and Structural Estimation in Corporate Finance." *Foundations and Trends in Finance* 6 (2012): 1–163. ISSN 1567-2395. 10.1561/0500000035.

TAYLOR, P. "Amount of Data Created, Consumed, and Stored 2010-2020, with Forecasts to 2025." 2023. Available at https://www.statista.com/statistics/871513/worldwide-data-created

TEOH, S. H., and Y. ZHANG. "Setting Statistical Hurdles for Publishing in Accounting." *Accounting, Economics, and Law: A Convivium* (2023): Forthcoming. https://doi.org/10.1515/ael-2022-0104.

TERRY, S. J. "The Macro Impact of Short-Termism." *Econometrica* 91 (2023): 1881–912. https://doi.org/10.3982/ECTA15420.

TERRY, S. J.; T. M. WHITED; and A. A. ZAKOLYUKINA. "Information Versus Investment." *Review of Financial Studies* 36 (2023): 1148–91.

VERRECCHIA, R. E. "Discretionary Disclosure." *Journal of Accounting and Economics* 5 (1983): 179–94.

WHITED, T. M. "Parallels Between Structural Estimation and Causal Inference: A Discussion of Armstrong et al.(2022)." *Journal of Accounting and Economics* 74 (2022), 101541.

YANG, L. "Innovation and Welfare Impacts of Disclosure Regulation: A General Equilibrium Approach." Working paper, Columbia University, 2024.

ZAKOLYUKINA, A. A. "How Common Are Intentional GAAP Violations? Estimates from a Dynamic Model." *Journal of Accounting Research* 56 (2018): 5–44.

ZHOU, F. S. "Disclosure Dynamics and Investor Learning." *Management Science* 67 (2021): 3429–46.