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ACCOUNTING RESEARCH AND THE ROLE OF MICROECONOMETRICS

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Abstract: The paper discusses and examines the presence of microeconometrics in contemporary accounting research. Quantitative methodology in accounting utilizes econometrics, particularly microeconometrics. Our analysis shows that approximately two-thirds of publications in leading journals, as well as submissions to the SSRN Accounting Research Network employ econometric methods, specifically within the field of financial microeconometrics. The papers reviewed in the author's two surveys typically use panel econometrics methods, methods of causal microeconometrics and qualitative variables modelling.

Keywords: econometrics, accounting, financial microeconometrics, applied accounting

JEL classification: C50, C58, G30, M40

INTRODUCTION

In 2009, this journal published paper entitled "Quantitative Methods in Accounting Research" [Gruszczyński 2009]. The original version, posted also on ResearchGate, gained significant popularity, accumulating over 26,000 reads to date. Fifteen years after its publication, I demonstrate that econometric methods, particularly microeconometrics, have become the standard in contemporary accounting research.

The use of quantitative methods in accounting research has been steadily increasing. Over 80% of papers in top accounting journals employ quantitative methods, primarily econometric techniques [Gruszczyński 2022]. This is confirmed in a new survey presented below in section entitled "Surveying accounting research papers for the use of econometric methods: the 2024 survey".

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The relationship between accounting and econometrics dates to the early 1900s [Ciompa 1910]. In accounting research, econometric methods are primarily rooted in microeconometrics, and this paper provides further evidence supporting this connection. Ongoing debates in accounting research underscore significant controversies around the use of quantitative methods and the direction of the field's research.

In the following sections, we highlight ongoing debates surrounding accounting and accounting research, explore the connections between accounting and econometrics, and present findings from a prior survey alongside the results of a new survey examining the application of econometric methodologies in accounting papers.

ACCOUNTING RESEARCH DEBATES

Numerous papers in prominent accounting journals highlight ongoing debates about the nature of accounting and the direction of research in the field. Below is a selection of discussions and comments.

I. A central question arises regarding the essence of accounting itself. **Is accounting a scientific discipline, a profession, or a craft?** Should it be classified as managerial science, economics, or finance? There is no universally accepted definition of accounting—some view it as a science, others as a profession or craft. Another question posed is whether accounting is a social and moral practice or purely technical [Carnegie et al. 2021].

The debate over accounting's classification among disciplines includes perspectives such as: „Accounting—like management sciences—focuses on specific organizations by measuring economic events and communicating the results of those measurements. The financial data generated by an organization's accounting system are used by the disciplines of economics and finance; (–) however, this does not imply that accounting is part of these disciplines" [Czapla and Walińska 2021; translated from Polish].

While this view is widely accepted, does it exclude out the study of topics and hypotheses that apply to multiple organizations simultaneously? Accordingly, one might argue that accounting researchers should be placed within economics or finance, as their research typically uses data from many organizations, not a single one.

II. Questions and doubts are also raised about **what drives accounting research**. Fraser and Sheehy [2020] point to factors that contribute to the perceived detachment of research from practice, identifying the following drivers:

- Academic rigor

"… many scholars have focused on making their research more rigorous, by using more scientific methodologies. Critics believe that this desire to increase the 'academic credibility' of accounting research has coincided with a disregard to make the research relevant and useful for practice."

- Universities incentive structure
  "… there has been a push by universities, certainly those outside the 'top' elite group, to improve their world university ranking (-) universities are putting a greater focus on the factors that can improve their ranking, with recruitment and incentives being geared towards improving the publication performance of universities."

- Public funding for research
  "Research is highly dependent upon the funding provided by national governments. (-) The very real problem facing research universities, is the fact that the costs of research continue to rise, while at the same time, increasing financial and budgetary pressures is causing governments to reduce direct funding to public research institutions".

III. The apparent **disconnect between accounting research and accounting practice** is frequently discussed issue. Fraser and Sheehy [2020], citing 68 papers, note the gap between academic research and real-world application. The authors see some solutions in the activity of institutions representing performance-based research funding systems.

Beyond the disconnect with practice, accounting research also faces challenges related to its limited **societal impact**, as noted by Osma et al. [2023].

IV. Accounting researchers frequently deliberate on general and methodological questions related to their work. Some **examples of debates on accounting research (AR)** include:

- Managerial empirical AR (2001-2002):
- publications by Ittner and Larcker [2002, 2002], Zimmermann [2001], Hopwood [2002]
- Practical relevance of public sector AR (2018-2020):
- publications by Ferry et al. [2018], van Helden [2019], Tucker et al. [2020]
- Appropriateness of methods and practices in AR (2022-2023)
- publications by Ohlson [2022, 2023], Johannesson et al. [2024], Breuer [2023]
- Feedback loop between theory and empirical research (2023-2024)
- 2023 *Journal of Accounting Research Conference* and Breuer et al. [2024].

V. An increasing focus within accounting research is the application of artificial intelligence (AI). **Emerging trends** include the use of AI technologies to manage the growing volume of textual and graphical data, utilizing techniques such as natural language processing and machine learning, as explored in recent work by Blankenspoor, de Haan, and Li [2024].

PAWEŁ CIOMPA AND ECONOMETRICS

Today, the primary methodologies used in accounting research (AR) are grounded in econometrics.

It is notable that the term "econometrics" was first coined by Paweł Ciompa (1867–1913), a Polish banker, teacher, and social worker. In his book, *Outline of Econometrics and Bookkeeping Theory*, [Ciompa 1910] published in Lviv, Ciompa wrote: "Just as physics represents mechanical, acoustic, and dynamic phenomena, so too should economic phenomena be represented by the science we call econometrics. Econometrics is based on economics, mathematics, and geometry, and is part of economics, just as trigonometry is part of geometry. Bookkeeping is merely an application of econometrics, just as mathematics applies the laws of algebra." (translated by Sojak [2022]).

Ciompa's concept of "econometrics" remained in this form until 1926, when Ragnar Frisch, writing in a Norwegian periodical, redefined the discipline as "econometrie" [Frisch 1926]. Frisch described econometrics as, "intermediate between mathematics, statistics, and political economy... a new discipline, which, for lack of a better name, may be called econometrics" [Israel 2016]. This newer interpretation of econometrics gained widespread acceptance, and Ciompa's original idea faded into obscurity. For further insights on Ciompa, see Sojak [2022], Israel [2016], and Gruszczyński [2022].

MICROECONOMETRICS – ECONOMETRICS FOR ACCOUNTING

Over time, econometrics evolved into a central research methodology in economics, with numerous econometricians receiving Nobel Prizes for their contributions. The field has grown alongside advances in economic theory, data availability, and computational tools.

A significant branch of econometrics is **microeconometrics**. As Heckman (Nobel Prize 2000, shared with McFadden) explains: *"Microeconometrics is a scientific field within economics that links the theory of individual behavior to individual data, where individuals may be firms, persons, or households."* [Heckman 2000]. Microeconometrics has developed rapidly, fuelled by the increasing availability of large microdata sets and the emergence of innovative methodological approaches.

Microeconometric methods, which are increasingly applicable to accounting, play a crucial role in establishing causal relationships. Causal microeconometrics has received high recognition:

– The Nobel Prize in Economics in 2021 was awarded to Card, Angrist, and Imbens for their contributions to analysing causal relationships.
– The Nobel Prize in Economics in 2019 went to Banerjee, Duflo, and Kremer for their use of causal experiments to address global poverty.

Today, microeconometric methods are applied across a wide range of social science disciplines, including accounting. Specifically, the application of microeconometric methodologies to corporate finance and accounting is known as *financial microeconometrics* [Gruszczyński 2006, 2020]. Typical microdata sets used in such research often consist of financial data from firms across time and location.

SURVEYING ACCOUNTING RESEARCH PAPERS FOR THE USE OF ECONOMETRIC METHODS: THE 2022 SURVEY

This section revisits a survey of selected papers from five leading accounting journals, covering publications from 2017 to 2021 [Gruszczyński 2022]. The journals included in this survey are:

- *European Accounting Review,*
- *Contemporary Accounting Research,*
- *Journal of Accounting Research,*
- *Journal of Accounting and Economics*
- *The British Accounting Review.*

The survey examines a single issue from each journal per year, totalling twenty-five issues and 246 papers. Key findings are presented in Table 1 (referenced as Table 3 in [Gruszczyński 2022]).

Table 1. Summary of the survey's main outcome (2017-2021)

	Number of papers	Percent of the total
Total number of papers published	246	100%
Number of papers that use any quantitative method	207	84%
of which:		
papers using econometric method(s)	165	67%
mathematical economics papers	23	9%
papers using other quantitative methods	19	8%

The survey reveals that 84% of the papers reviewed employ quantitative methodology, with two-thirds (67%) utilizing econometric methods specifically. Table 2 (referenced as Table 4 in [Gruszczyński 2022]) provides breakdown of the various

econometric approaches used. Of the 165 papers applying econometric methodology, 73 (44%) utilize more than one econometric technique.

Table 2. Numbers of papers using specific econometric methods (2017-2021)

Papers with the use of econometric method(s)	165
more than one method applied (44% of "econometric" papers)	73
regression – cross section/ time series (no panel approach): returns (Fama-MacBeth), survey data etc.	24
regression/ time series (event analysis, finance)	6
panel data models (78% of "econometric" papers)	129
models of qualitative variables: binomial (logit/ probit/ LPM) also panel approach	40
models of qualitative variables: multinomial	9
model of limited-dependent variables (tobit)	1
models of causality: treatment effects (PSM, RDD, diff-in-diff)	29
count data model	1
sample selection (Heckman)	7

It is important to emphasize that econometric approaches applied here fall under the category of microeconometrics. The theories and hypotheses in these papers are tested using samples of firms, their reports, financial events, and similar data, also over time, aligning with methodologies in financial microeconometrics.

The most widely used methodology is panel data econometrics, typically involving linear models with fixed effects (FE). Papers employing panel econometrics represent 78% of all those in econometric category. Models of qualitative variables are also common, appearing in 30% of papers, followed by causal microeconometrics models, which account for 18%.

SURVEYING ACCOUNTING RESEARCH PAPERS FOR THE USE OF ECONOMETRIC METHODS: THE 2024 SURVEY

Survey characteristics and main outcome

The new survey, conducted in 2024, examines the presence of quantitative and econometric methods in accounting publications. It includes preprint submissions to the Social Science Research Network (SSRN), specifically within Accounting Research Network (ARN) from January 2022 to August 2024.

The submissions were sampled from the following ten selected ARN subject areas (*ARN eJournals*):

- *Accounting - Disclosure eJournal*
- *Accounting, Corporate Governance, Law & Institutions eJournal*
- *Auditing eJournal*
- *Behavioral & Experimental Accounting eJournal*

- *Demographics, Gender & Diversity in Accounting eJournal*
- *Financial Accounting eJournal*
- *International Accounting eJournal*
- *Managerial Accounting eJournal*
- *Other Accounting Research eJournal*
- *Research Methods & Methodology in Accounting eJournal*.

From a total of 10,330 submissions to these *eJournals* during the specified period, 200 submissions were randomly selected for the survey. The main findings are presented in Table 3.

Table 3. Summary of the survey's main outcome (2022-2024)

	Number of papers	Percent of the total
Total number of papers published	200	100%
Number of papers that use any quantitative method	165	83%
of which:		
papers using econometric method(s)	129	65%
mathematical economics papers	10	5%
papers using other quantitative methods	36	18%

A survey of submissions (working papers) conducted two years after the review of papers published in top accounting research journals reveals similar findings: 83% of papers utilize quantitative methodology. Consistent with previous results, two-thirds (65%) of these papers apply at least one econometric method. Table 4 provides further details, following the framework presented in Table 2.

Table 4. Numbers of papers using specific econometric methods (2022-2024)

Papers with the use of econometric method(s)	129
more than one method applied (52% of "econometric" papers)	67
regression – cross section/ time series (no panel approach): returns (Fama-MacBeth), survey data etc.	21
regression/ time series (event analysis, finance)	13
panel data models (74% of "econometric" papers")	95
models of qualitative variables: binomial (logit/ probit/ LPM) also panel approach	7
models of qualitative variables: multinomial	12
model of limited-dependent variables (tobit)	5
models of causality: treatment effects (PSM, RDD, diff-in-diff)	46
count data model	0
sample selection (Heckman)	0

Similar to earlier survey, 52% of the econometric papers in the 2024 use two or more econometric approaches (67 out of 129 papers). As before, the most popular methodology is panel econometrics, which accounts for 74% the of papers). Causal econometrics includes 46 papers, representing 36% of all econometric papers, marking a significant increase from the 2022 survey (20%).

Characteristics of microeconometric papers in the 2024 survey

Submissions to SSRN Accounting Research Network typically utilize large datasets and apply microeconometric methods. Here, we focus on panel data regressions, which are present in 74% of all econometric papers (48% of all papers), and on papers employing causal microeconometrics (36% of all econometrics papers).

A) Fixed effects (FE)

Fixed effects are included in all panel data models estimated and assessed. Depending on the subject and the data analysed, the fixed effects represent various characteristics. The popularity of fixed effects among accounting researchers may explain the publication of the primer on FE in 2024 issue of the *Journal of Accounting Research*. The authors, Breuer and de Haan, summarize the features of fixed effects as follows: "By eliminating unwanted variation, FE reduce concerns that omitted variables bias our estimates or weaken test power. FE are not costless, though, so their use should be carefully justified by theoretical and institutional considerations. FE also transform samples and variables in ways that are not immediately apparent, and in doing so affect how we should interpret regression results." [Breuer and de Haan 2024].

In our survey, fixed effects are present in all panel data submissions. Below are examples of states/characteristics represented by fixed effects in the papers from the 2024 survey:

- year FE, quarter FE, day FE, firm FE, auditor FE, industry FE, region FE, analyst FE,
- emotion FE (happy, sad, angry, disgusted, scared, surprised, and neutral) (paper on CEO[1] facial expressions and analyst forecast dispersion)
- ESSwave&country FE/ ESSwave*countryFE/ father&mother occupation FE/ income category FE/right-left politics FE (research on values and membership in the accounting profession)[2]
- country-pair FE/ deposit country-quarter-year FE (paper on mandatory disclosure program for aggressive tax arrangements);
- exposure draft FE/ constituent type FE/ cohort FE (paper on language frictions and the IASB[3]);

[1] CEO=Chief Executive Officer.
[2] ESS=European Social Survey.
[3] IASB=International Accounting Standards Board.

- rank FE/ business unit FE/ function FE/ country FE (paper on employees' voluntary departure decisions and assessed potential)
- firm-MSA FE/MSA-quarter FE (MSA=master service agreement) (paper on job posting culture information and employee inflow);
- exchange FE/ exchange*currency pair FE/ base currency*year month FE (paper on value of auditor assurance in cryptocurrency trading).

B) Causal microeconometrics

Methods of causal microeconometrics present in the 2024 survey include various forms of difference-in-differences approaches (DID), propensity score matching (PSM), and other. These methods include:

- Stacked DID
- Quasi-natural-experiment and DID
- Staggered DID
- DID and PSM
- DID with entropy balancing matching
- Synthetic DID
- PSM, entropy balancing.

C) Topics of papers

Texts submitted to SSRN Accounting Research Network encompass a wide range of topics. Many papers belong to traditional accounting discipline only in a broader sense. Below is the selection of topics presented in the submissions to the ARN:

- Accounting conservatism and the reliability of earnings forecasts
- ChatGPT and corporate policies
- Network connectedness and the convergence of audit styles
- Value of auditor assurance in cryptocurrency trading
- Firms' asymmetric cost management during the COVID-19 pandemic
- Local newspaper closures and bank loan contracts
- Communicating corporate culture in labour markets
- Employees' voluntary departure decisions and assessed potential
- How does carbon footprint information affect consumer choice?
- Language frictions and the IASB's due process
- The ability of mandatory disclosure rules to crack down on offshore tax evasion
- How accountants' distinctive values shape their judgements and decisions
- Role of disclosures in facilitating coordinated innovation between supply chain partners
- Consequences of public accounting offshoring

- Peer effects in ESG Ratings[4]: Evidence from gender pay gap disclosures.

The list above consists of fifteen topics selected from two hundred submissions to the ARN. This list is by no means comprehensive or fully representative for accounting research today. What may strike the reader is the variety of subjects that can be researched and prepared for submissions to accounting journal. Returning to our main message here: all these papers use econometric methods applied to large sets of microdata.

CONCLUSION

We examine the occurrence of microeconometric methodologies in accounting research. The main part of this paper is devoted to presenting outcomes of the survey of 200 papers submitted to SSRN Accounting Research Network in the period of January 2022 – August 2024. These results are compared to those of an earlier survey of the top five accounting journals in the period of 2017-2021.

In terms of applying quantitative methodology, the submissions to the SSRN Accounting Research Network (the 2024 survey) resemble papers published in renowned accounting journals (the 2022 survey): with 83% and 84% respectively. Moreover: two-thirds of texts submitted to the ARN (65% in the 2024 survey) or published in the journals (67% in the 2022 survey) apply econometric methods.

Although papers submitted to ARN are not reviewed, the research methods used in these papers are consistent with those in rigorously reviewed papers published in top international journals. Both sets of papers heavily rely on panel data econometrics, with 74% and 78% of all econometric papers in the 2024 and the 2022 surveys, respectively.

A major difference is the higher prevalence of causal microeconometrics in the 2024 survey, with 36% compared to 20% in the 2022 survey. This may be due to the growing popularity of new methods, which we highlight in the 2024 sample of submitted texts.

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[4] ESG = Environmental, Social and Governance

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