The Evolution of Research on the Digital Economy*

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Abstract

Interdisciplinary research attracts substantial funding due to its potential to address complex questions by integrating diverse perspectives. Digital economy research exemplifies this trajectory, having evolved organically in response to emerging technologies and the need to inform policy. This meta-study analyzes how knowledge evolves and diffuses within this research field, drawing on a unique dataset of 8,446 papers presented at 197 conferences between 1989 and 2024. I enrich the data with information on abstracts, authors, and journals from Google Scholar, OpenAlex, and the SSRN Economics of Networks eJournal, and complement it with expert interviews. Using natural language processing, including topic modeling, I identify long-term thematic trends and a transition from theoretical exploration to empirical validation. The results reveal strong growth in conferences, global reach, research output and community size, alongside shifting disciplinary contributions. I develop a conceptual framework in which pioneers, enablers, and engagement drive field evolution across three stages: emergence, consolidation, and diversification. The study offers practical guidance for conference organizers, funding providers, policymakers, and editors.

Keywords: digital economy, interdisciplinary, science of science, knowledge evolution

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Access to the paper companion website: https://sites.google.com/view/digital-economy-research.

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1 Introduction

In 1968, Douglas Engelbart gave a live demonstration of the groundbreaking developments of the Stanford Research Institute's Augmentation Research Center. "The Mother of All Demos" marked a pivotal moment in the history of computing.[1] It showed an integrated computer hardware and software system, the computer mouse, a graphical user interface, and real-time collaboration. Innovations like these paved the way for the internet and digital platforms, which have reshaped markets, organizational structures, and society at large.

As digital technologies became economically important, the need for rigorous academic research to inform policy and ensure efficient, competitive markets grew accordingly (Kesler et al., 2017; Aguiar and Waldfogel, 2018; Nicolle et al., 2018; Quinn and Gutt, 2025; Zhu et al., 2025). Researchers from computer science, economics, information systems, and management began examining their impacts, which gave rise to the interdisciplinary field of digital economy research. Governments and funding institutions increasingly value interdisciplinary approaches for addressing complex challenges and allocate substantial resources to support them (Salter and Martin, 2001; Lyall et al., 2013; Sun et al., 2021; Veugelers et al., 2025).[2] Digital economy research has played a key role in informing regulatory efforts by the European Commission as well as antitrust and intellectual property (IP) investigations in the U.S. and the U.K. (Seamans and Zhu, 2014; Zhu and Liu, 2018; Aguiar et al., 2018; Gavazza et al., 2019; Brynjolfsson et al., 2019a; Crémer et al., 2019; Cabral et al., 2021; Peukert et al., 2022; Dubé et al., 2025; Lutes et al., 2025). Understanding the evolution of this field is therefore not only of scientific interest but also essential for assessing its influence on past and future policymaking.

This meta-study analyzes how research on the digital economy has evolved over time. It addresses this question by examining the growth of the research output and the community, as well as changes in institutional affiliations, collaboration patterns, disciplinary contributions, and research topics and methods. Overall, this study contributes to the broader understanding of how knowledge evolves and diffuses (Jovanovic and Rob, 1989; Kuhn, 1997; Sorenson and Fleming,

[1] See https://dougengelbart.org/content/view/209/.

[2] See, for example, funding programs of the U.S. National Science Foundation (https://new.nsf.gov/funding/learn/research-types/learn-about-interdisciplinary-research), the Swiss National Science Foundation (https://www.snf.ch/en/sEF1Lm4CUyA7qjR7/news/project-funding-collaborative-and-interdisciplinary-projects-growing-in-importance), or the German Research Foundation (https://www.dfg.de/en/news/news-topics/announcements-proposals/2024/ifr-24-33).

2004; MacGarvie, 2005; Singh, 2005; Martin, 2012; Martin et al., 2012; Kahn and MacGarvie, 2016a; Fortunato et al., 2018; Atkin et al., 2022; Baruffaldi and Poege, 2025). Specifically, it shows how digital technologies have transformed academic thinking across disciplines.

My analysis draws on a unique dataset of 8,446 cutting-edge research papers presented at 197 conferences between 1989 and 2024.[3] I enrich the data with information on paper abstracts, authors, and journals from Google Scholar, OpenAlex, and the SSRN Economics of Networks eJournal, and complement it by insights from expert interviews. Advanced natural language processing (NLP) techniques, including topic modeling with *BERTopic*, help identify thematic trends over time.

I develop a conceptual framework of field evolution with three stages, each defined by a key driver: (i) pioneers driving its emergence (1989 – 2000), (ii) enablers providing the resources for expansion during consolidation (2001 – 2015), and (iii) engagement with policy debates sustaining its diversification (2016 – present). In the emergence stage, research was fragmented, funding scarce, and data limited, resulting in theory-driven work by economists and computer scientists on digital technologies, their cost-reduction potential, and labor-market impacts. During the consolidation stage, enabling institutions and funding agencies helped scale the field by expanding the global dispersion of conferences and fostering collaboration. Improved data access enabled a shift to empirical research on innovation and digital platforms, led mainly by economists and information systems scholars. The diversification stage has been defined by rapid expansion in the number of conferences, papers, and the research community. While the field remains inherently interdisciplinary, management has become the leading discipline. Research is now largely driven by causal empirical work focused on platforms, social media, and artificial intelligence (AI). Through continuous engagement with policymakers, digital economy research has played a central role in shaping public debates.

This meta-study goes beyond traditional literature reviews by systematically analyzing a large number of conference papers bridging several academic disciplines over 35 years. Using NLP and topic modeling, it uncovers long-term thematic trends. By focusing on conferences as platforms for knowledge exchange and developing a conceptual framework for field evolution, I provide new insights into the dynamics of academic thinking. The study concludes with

[3]Throughout this paper, the term "conferences" is used as a shorthand to collectively refer to conferences, summer institutes, symposiums, and workshops.

key takeaways to guide the next stage of digital economy research: conference organizers and leading scholars should foster inclusive research communities, funding providers should expand support for interdisciplinary and global initiatives, policymakers should ensure data access and continuous knowledge exchange with academia, and editors should adapt publication cycles to keep pace with technological change.

2 A historical perspective on digital economy research

To do a structured analysis that extends beyond digital economy research, I develop a conceptual framework for field evolution. It includes three stages – emergence, consolidation, and diversification – each defined by a key driver: pioneers, enablers, and engagement. Section 5.4 provides a detailed description of this framework, and Table 2 summarizes it.

2.1 Emergence (1989 – 2000)

The research on the digital economy has its origins in early work on computer science, with early systematic studies on the internet emerging from the Massachusetts Institute of Technology (MIT) (see, for example, Ein-Dor (1985); Boehm (1987); Schneidewind (1987); Wrigley and Dexter (1988); Brynjolfsson (1993)). As the potential of the internet to dramatically reduce costs and reshape economic activity became apparent, it captured the attention of economists (Kuhn, 1997; Greenstein, 2015). This sparked the appearance of foundational papers in economics journals, with early contributions addressing key issues at the intersection of technology and markets.[4]

A pivotal moment in the emergence of digital economy research was the first *Workshop on Information Systems and Economics* (WISE) in Cambridge, MA, on December 3, 1989 (Greenstein, 2011). The pioneering organizers Yannis Bakos and Chris F. Kemerer aimed to create a platform for interdisciplinary dialogue at the intersection of information systems and economics (Bakos and Kemerer, 1989).[5] Since then, conferences targeted at digital economy research have become vital platforms for exchange in this dynamic and interdisciplinary field.

[4]One of the first journals to publish research at the intersection of economics, management, and public policy was *The Bell Journal of Economics and Management Science* (now called *The RAND Journal of Economics*). It was founded in 1970 as an industry initiative to foster academic research in industrial organization, regulation, and law and economics (see `https://www.jstor.org/journal/belljeconmanasci`).
For a bibliography on electronic commerce research, see, for example, Appendix B in Smith et al. (2000).

[5]To capitalize on overlapping research interests, WISE was strategically scheduled immediately before the International Conference on Information Systems (ICIS), a tradition that continues to this day.

The late 1990s witnessed a growing number of events in the U.S. For example, in 1999, the U.S. Department of Commerce organized the *Understanding the Digital Economy* conference to fulfill President Clinton's directive to the National Economic Council. The directive reflects an early policy-driven interest in developing new methods of data collection and research to assess the impact of the digital economy and to identify effective ways to measure and evaluate it both domestically and internationally (Brynjolfsson and Kahin, 2000). Other notable examples of conferences include: *Current Issues in Managing Information Technology* (MIT, 1999), *Reinventing Commerce at Net Speed* (Stanford University, 1999), and *Measuring E-Commerce* (Brookings Institution, 1999) (Kovacic and Shapiro, 2000; Smith et al., 2000).

2.2 Consolidation (2001 – 2015)

In the early 2000s, Europe saw significant progress in digital economy research, which was driven by the emergence of influential conferences initiated and funded by a number of key institutions. The Danish Research Unit for Industrial Dynamics (DRUID) launched its annual conference in 1995, establishing a critical platform for research on innovation, technology and economic development, and entrepreneurship.[6] Over the years, DRUID expanded its geographical presence by hosting conferences across Europe as well as in New York and Singapore, further enhancing its international dispersion. With an even stronger focus on the digital economy, the ZEW (Leibniz Centre for European Economic Research) Conference on *The Economics of Information and Communication Technologies (ICT)* was launched in 2001 in Mannheim, Germany. Reflecting ZEW's mission to provide high-quality research and evidence-based policy advice, the conference has consistently attracted leading researchers from North America and Europe and remains a cornerstone in the field. The same year, the Toulouse School of Economics (TSE) introduced its *Digital Economics Conference*, placing greater emphasis on theoretical contributions to digital economy research. Funding for the ZEW and TSE conferences was provided by the hosting research institutions, with their establishment primarily driven by the organizers' efforts.[7] Together, these European initiatives fostered a robust transatlantic exchange that advanced the field's intellectual development while increasing the visibility of digital economy research in public debates.

In 2010, efforts to formalize and advance digital economy research gained significant momentum

[6] See https://druid.dk/conferences/.

[7] Both institutions are primarily funded through public sources.

in North America. Inspired by the European initiatives, Shane Greenstein sought to foster independent academic research on the digital economy, aiming to ensure that this emerging field was not solely driven by industry. Shane Greenstein obtained funding from the Alfred P. Sloan Foundation to establish a dedicated research project at the National Bureau of Economic Research (NBER) (Greenstein, 2011, 2014). In April 2010, a group of researchers met at the Alfred P. Sloan Foundation in New York City to discuss strategies for advancing the field. Shortly after, a selection of papers was presented at the first NBER meeting on the *Economics of Digitization*, which marked the formal launch of the project (Greenstein, 2011). Concurrently, the NBER *Summer Institute* and related annual conferences became pivotal venues for discussing research on the digital economy.

2.3 Diversification (since 2016)

A significant milestone in community building was the launch of the NBER *Digitization Tutorial* in 2015, an annual event that invites approximately 50 Ph.D. students to engage with leading researchers in the field. Held alongside the *Economics of Digitization Conference*, this tutorial aims to integrate the next generation of scholars into the research community. Later, also other conferences included Ph.D. workshops in their programs. At large, the research on the digital economy has established a community of scholars who are interested in "exploring the enormous changes that digitization has brought to transaction costs, media functions, product personalization, and many other facets of modern life" (Greenstein, 2020).

In 2023, the Alfred P. Sloan Foundation encouraged the integration of the NBER *Economics of Digitization* project and the NBER *Economics of Artificial Intelligence* project into the unified NBER *Digital Economics and Artificial Intelligence* project to streamline funding. This reflects the growing overlap between research on the digital economy and AI. Recently, there has been a notable surge in AI conferences and workshops; however, their specialized nature places them outside the scope of this study.

Overall, the history of digital economy research shows that pioneering scholars were crucial in establishing the field, with funding acting as an enabler for its expansion. The field has consistently engaged with public debates, shaping both academic discourse and policymaking.

3 Related literature

The literature on the digital economy encompasses a wide range of systematic reviews and thematic studies, offering insights into the field's evolution. Early contributions were fundamental in understanding how digital technologies transform economic activity. In a seminal article, Bakos and Kemerer (1992) present a literature review on emerging research trends in information systems and introduce the concept of the "economics of information technology" to establish a shared foundation and research tradition within the field. Similarly, Smith et al. (2000) examine the rise of electronic markets, addressing key issues such as price efficiency, market friction, and price dispersion, while Varian et al. (2004) provide a broad overview of the economics of information technology. These early studies laid the groundwork for understanding the economic implications of digital technologies and set the stage for subsequent research.

Later reviews further consolidate the field. In their books, Greenstein et al. (2013) and Goldfarb et al. (2015) compile key papers published since 1999, offering a comprehensive overview of the developments in digital economics. Expanding on this, Greenstein (2020) summarizes research from the NBER *Economics of Digitization* project, focusing on the role of digitization in new goods, digital platforms, and privacy. Together, these studies provide valuable resources for scholars, capturing the consolidation stage of digital economy research.

Beyond these broader reviews, more focused thematic studies have examined particular aspects of the digital economy in its diversification stage. Peukert (2019) proposes a research agenda for cultural economics, drawing on a detailed review of the existing literature. Thomas et al. (2014) conduct a systematic review of platform literature in management research, while De Reuver et al. (2018) examine digital platforms from an information systems perspective. Extending this focus, Rietveld and Schilling (2021) offer an interdisciplinary review of platform competition. Their inclusion of visual summaries and open-access datasets exemplifies best practices in systematic reviews and serves as a vital resource for understanding platform ecosystems.

Moreover, several studies highlight the transformative nature of digital technologies on economic and societal structures. Agrawal et al. (2016) frame "machine intelligence" as a cost-lowering tool for prediction tasks, reshaping industries and emphasizing the increasing value of human judgment in decision-making. Goldfarb and Tucker (2019a,b) explore how digital technologies have substantially reduced costs associated with search, replication, and transportation,

which fundamentally changed market structures and consumer behavior. Building on this work, Agrawal et al. (2019) set an agenda for AI research from an economic perspective. More recently, Goldfarb and Tucker (2024) summarize research on the economics of privacy, and Aridor et al. (2024) address the economics of social media, exploring content life cycles, misinformation, political impacts, and consumer behavior.

While these reviews offer valuable insights, they often focus on specific disciplines or themes, overlooking the interdisciplinary and dynamic nature of digital economy research. This meta-study addresses these gaps in four ways. First, it integrates perspectives from computer science, economics, information systems, and management, providing an interdisciplinary view of the field's evolution. Second, this study examines conference papers rather than relying solely on journal publications, capturing cutting-edge research and early knowledge exchange. This is particularly relevant given the publication barriers and delays that historically shaped the field.[8] The result is a dynamic and forward-looking analysis that reflects the evolving nature of the field. Third, it conducts a 35-year longitudinal analysis of 8,446 papers using advanced NLP methods (*SpaCy*, *BERTopic*), which allow for large-scale and unbiased identification of thematic trends and patterns (Miric et al., 2023). In addition, I apply generative AI models, which are becoming increasingly valuable for supporting various stages of academic research (Toner-Rodgers, 2024). Finally, I draw on these findings to develop a conceptual framework for field evolution and to outline implications for conference organizers, funding providers, policymakers, and editors.

4 Data sources

Defining the boundaries of a study analyzing the evolution of research on the digital economy is a complex task. Unlike more established fields, there is no single journal, specific institution, or discipline that exclusively encompasses this research field. However, cutting-edge research is typically presented at conferences, which serve as platforms for researchers to share preliminary findings, gather feedback, and engage with the community before submitting their work for journal publication.[9] These events play a crucial role in shaping academic thinking, as they foster the diffusion of innovative ideas and methodologies. Therefore, I begin by identifying

[8] Shane Greenstein, one of the experts interviewed for this study, noted that early digital economy researchers frequently published in edited volumes to avoid delays in academic journals, where it was difficult to quickly publish emerging topics.

[9] Most conference submissions are screened by a scientific committee. A few conferences, such as DRUID and CIST, provide detailed review reports.

Table 1: Academic conferences and workshops on digital economy research

Conference	Collected since	Collected until	First year	Last year
WISE - Workshop on Information Systems and Economics	1989	2023	1989	2024
DRUID Conference	1997	2024	1996	2024
Understanding the Digital Economy	1999	1999	1999	1999
TSE Digital Economics Conference	2001	2024	2001	2024
ZEW Conference on the Economics of ICT	2001	2024	2001	2024
SCECR - Symposium on Statistical Challenges in Electronic Commerce Research	2005	2024	2005	2024
Paris Conference on Digital Economics	2008	2024	2006	2024
Searle Conference on Internet Search and Innovation	2010	2015	2010	2017
NBER Conference Economics of Digitization	2011	2024	2011	2024
NBER Summer Institute IT and Digitization/ Digital Economics and AI	2012	2024	2012	2024
BU Platform Strategy Research Symposium	2013	2024	2013	2024
MIT Conference on Digital Experimentation	2014	2024	2014	2024
Munich Summer Institute	2016	2024	2016	2024
CESifo Area Conference on Economics of Digitization	2017	2024	2017	2024
NBER Conference Economics of Artificial Intelligence	2017	2024	2017	2024
CIST - Conference on Information Systems and Technology	2018	2024	1996	2024
Digital Economy Network Workshop	2019	2024	2019	2024
Management Analytics And Data Conference	2022	2024	2022	2024
European Digital Platform Research Network Summit	2023	2024	2023	2024

Note: *Collected since* and *Collected until* represent the earliest and latest years for which detailed data on the conference program was obtained, although some conference programs may be missing within this range. *First year* and *Last year* indicate the inaugural year and the most recent year the conference has been held.

and collecting data from conferences that are most relevant to digital economy research. To construct a comprehensive dataset, I compiled a list of conferences, which I refined and verified through expert interviews to ensure the inclusion of the most relevant events.

Table 1 lists the conferences and workshops that I include in this study, covering the period from 1989 to 2024.[10] To compile the data, I conducted an extensive internet search for historical conference programs. If programs were unavailable on the official event websites, I searched for archived copies of websites on the Wayback Machine.[11] In cases where programs were still inaccessible, I reached out to the organizers. In sum, I was able to gather information on 8,446 papers presented across 197 conferences. From the collected programs, I extracted detailed information about each paper, including its title, presenter, and their affiliation, as well as the co-authors and their affiliations (when available). I employed generative AI tools, such as ChatGPT-4.0 and Microsoft Copilot, to automate the extraction process.[12]

To enrich the dataset, I supplemented the conference program data with additional information from Google Scholar, OpenAlex, and the SSRN Economics of Networks eJournal. Due to strict access limitations to Google Scholar data, I used an API provider to retrieve this data.[13]

[10] While this list is extensive, it does not cover every single conference related to the digital economy, which is a limitation of this study.

[11] The Wayback Machine can be accessed at https://web.archive.org/.

[12] After feeding the program – only a few pages at a time – into the AI tool, I carefully verified each output manually, cross-checking it against the original sources to ensure accuracy and reliability (Horton, 2023).

[13] Google Scholar data was accessed via SerpAPI at https://serpapi.com/google-scholar-api.

This approach allowed me to gather additional details for 4,922 papers, including the year of publication, the total number of citations, the number of alternative versions available, and the abstract. I also collected the journal name, a direct link to the paper, and author profile links when available.[14] Moreover, I used OpenAlex, an open-source platform for scholarly metadata, to retrieve additional information about the papers presented at the conferences (Priem et al., 2022).[15] I was able to obtain information on abstract texts, authors, and citation counts for 2,813 papers.[16] In addition, I scraped all publications from the SSRN Economics of Networks eJournal, as some conference papers may have also been published there as working papers.[17] I used fuzzy matching techniques based on titles and authors to integrate these papers into my dataset.[18] Through this process, I matched 479 papers, along with their year of publication, number of downloads, assigned keywords, and abstracts. The final dataset comprises 8,446 papers presented at 197 conferences between 1989 and 2024. Of these, 6,881 papers include abstracts, which enable me to do further NLP analysis.[19]

In addition to quantitative data, I collected anecdotal evidence about the evolution of digital economy research through interviews with key experts in the field.[20] These interviews provided valuable context about the beginnings of the field, major trends in research, and the factors driving its evolution.

[14] For Google Scholar, only the first search result for each paper title and author combination was accessible. When the result was unambiguous, the abstract text was complete. However, in cases with multiple results, the extracted data was often truncated, limiting its completeness. It is important to note that Google Scholar's search algorithm, combined with the potential for changes in paper titles or author affiliations over time, introduces a small risk of errors in the retrieved data. Despite this limitation, the search algorithm is optimized to ensure that the first result aligns closely with the search terms, minimizing potential inaccuracies.

[15] OpenAlex was designed as a replacement for the Microsoft Academic Graph.

[16] For longer abstracts, OpenAlex only allows the extraction of the first few sentences.

[17] The SSRN Economics of Networks eJournal has published over 15,000 papers, dating back to 1972, with most published since the early 2000s. It is sponsored by the Networks, Electronic Commerce, and Telecommunications (NET) Institute, a non-profit organization dedicated to advancing research on network industries, digital platforms, electronic commerce, telecommunications, and the internet. It is accessible at https://papers.ssrn.com/sol3/JELJOUR_Results.cfm?form_name=journalBrowse&journal_id=1475417.

[18] For matching of paper titles, authors, and institutions, I used the Python packages *rapidfuzz* and *fuzzywuzzy*.

[19] As mentioned earlier, a limitation of the dataset is that not all abstracts are complete, which complicates the use of sophisticated text-based approaches that rely on a larger number of tokens. For 876 papers listed on the conference programs, no additional information could be found via Google Scholar, OpenAlex, or the SSRN Economics of Networks eJournal.

[20] These experts are: Irene Bertschek, Professor of Economics of Digitalisation at the University of Giessen, Director of the ZEW Research Unit Digital Economy, and co-founder of the annual ZEW *Economics of ICT Conference*; Erik Brynjolfsson, Professor at the Stanford Institute for Human-Centered AI, Director of the Stanford Digital Economy Lab, and co-founder of the NBER *Economics of Digitization* project; Jacques Crémer, Professor of Economics and Director of the Digital Center at the Toulouse School of Economics, and co-founder of the TSE *Digital Economics Conference*; Avi Goldfarb, Professor of Marketing at the University of Toronto and co-founder of the NBER *Economics of Artificial Intelligence* project; Shane Greenstein, Professor of Business Administration and co-chair of the Harvard Business School Digital Initiative, and co-founder of the NBER *Economics of Digitization* project; and Stephen P. Ryan, Professor of Economics at Washington University in St. Louis and organizer of the *CESifo Area Conference on Economics of Digitization*.

5 Measuring the evolution of digital economy research

5.1 A growing research field

5.1.1 Conferences covering digital economy research

This meta-study leverages cutting-edge conference presentations to analyze the evolution of digital economy research over time. The analysis is based on a set of conferences in the field, listed in Table 1. The columns *First year* and *Last year* indicate the inaugural and most recent years the conferences and workshops were held, respectively. However, as conference programs were not accessible for all years, *Collected since* and *Collected until* denote the earliest and latest years for which detailed program data was available.[21]

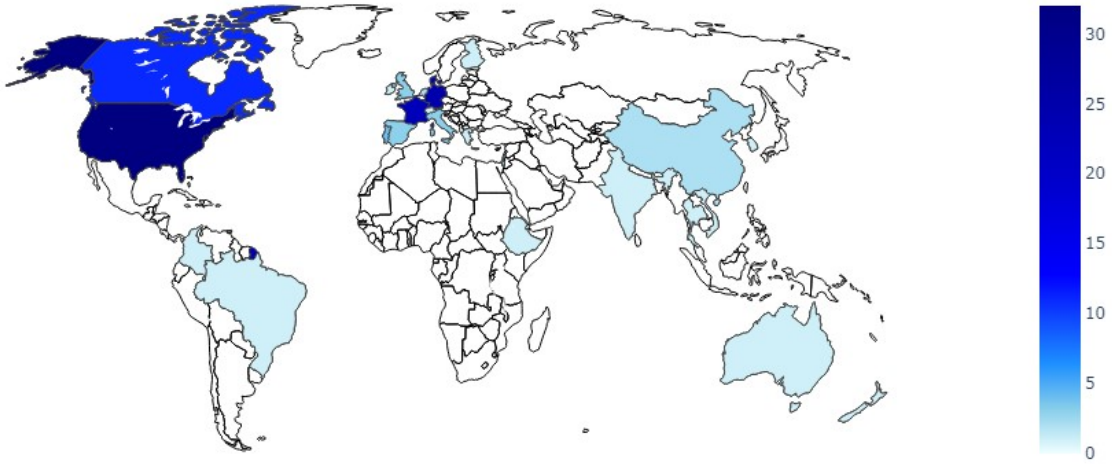
The first conference dedicated to digital economy research was the *Workshop on Information Systems and Economics* (WISE), held in 1989. It took several years before other conferences emerged: the *Conference on Information Systems and Technology* (CIST) and the *Danish Research Unit for Industrial Dynamics* (DRUID) annual conference started in 1996. In the consolidation stage, more European conferences gained prominence, with the *Digital Economics Conference* hosted by the Toulouse School of Economics (TSE) in France and the *Economics of ICT Conference* hosted by ZEW Mannheim, Germany, both starting in 2001. The field grew further with the launch of key events by the NBER, including the NBER *Conference on the Economics of Digitization* in 2011. Soon after, the NBER *Summer Institute on IT and Digitization* (now continued as NBER *Summer Institute on Digital Economics and Artificial Intelligence*) and the NBER *Conference on the Economics of Artificial Intelligence* had their first meetings. During the diversification stage, we see more specific conferences appearing, including the *Management Analytics and Data Conference* and the *European Digital Platform Research Network Summit* (EU DPRN). Apart from that, several new conferences focusing explicitly on AI have been established over the past few years; however, these were not within the scope of this study.

5.1.2 Geographical dispersion of conferences

Conference organization practices shape the geographical dispersion of digital economy research. Some conferences remain tied to their funding institution, while others rotate internationally.

[21] The analysis is limited by the selection of conferences included and the incomplete availability of conference programs, representing a lower bound on the actual number of papers presented.

Figure 1: Cumulative conference locations worldwide (1989 – 2024)



Note: The figure illustrates the cumulative number of conferences hosted in each country between 1989 and 2024, based on data from the conferences listed in Table 1. It also includes conferences for which the program could not be obtained. Interactive version: https://sites.google.com/view/digital-economy-research.

Figure 1 illustrates the cumulative global distribution of conference locations from 1989 to 2024. The United States leads with more than three decades of activity and 109 conferences, followed by Germany (42 conferences over 24 years, mainly in Mannheim and Munich), France (36 over 22 years, largely in Paris and Toulouse), and Denmark (24 over 23 years, mostly in Copenhagen). In North America, Cambridge, MA, Boston, and Stanford stand out as long-term hubs. Since the 2010s, rotating events such as SCECR and WISE have broadened the map, yet conferences outside North America or Europe remain rare. Only occasional meetings have been held in Asia, Australia, and South America, and just one – SCECR 2015 in Addis Ababa – took place on the African continent, highlighting persistent regional inequalities in global research exchange.

5.1.3 Research output

Digital economy conferences have expanded markedly over the past three decades – in number, geographic reach, and research output. The left panel of Figure A.1 in the Appendix illustrates the total number of papers presented annually from 1989 to 2024 across all conferences with available program data (see Table 1). The number of papers is directly correlated with the number of conferences held, with most papers presented at only one event (maximum: seven). In the emergence stage (1989 – 2000), annual output was low and stable. The consolidation stage (2001 onward) saw a marked increase, driven by the dot-com boom and rapid internet adoption, before dipping briefly during the 2011/2012 financial crisis amid uncertainty about

the continuity of some conference. The diversification stage since 2016 has brought the steepest growth, coinciding with the rise of streaming platforms, online marketplaces, and, more recently, the digital acceleration from the Covid-19 pandemic and a surge in AI-related research. The sustained growth in conferences and papers highlights the digital economy's rise as a field of academic significance and its engagement with societal and political debates (Brynjolfsson et al., 2003; Crémer et al., 2019; Gavazza et al., 2019; Cabral et al., 2021; Peukert et al., 2022; Galasso, 2023; Dubé et al., 2025; Lutes et al., 2025).

5.1.4 Research community

Most importantly, pioneering individuals drive the evolution of research on the digital economy. The right panel of Figure A.1 shows the cumulative total number of authors contributing to digital economy research. The figure reflects a strong and consistent increase in the number of scholars entering the field. While growth was steady during the consolidation stage, with around 220 new authors joining annually, it steepened markedly in the diversification stage. By 2024, approximately 640 new authors are joining each year, bringing the total number of scholars who have at least partially contributed to digital economy research to nearly 7,800. This acceleration underscores the increasing relevance and attractiveness of the field to researchers across disciplines.

Some individual researchers have had an immense impact on this field over the past decades. Figure A.2 shows the distribution of the total number of papers per author presented at conferences on digital economy research between 1989 and 2024. The majority of authors contribute only a few papers: approximately 43% have presented either one or two papers. In contrast, a small group of highly productive researchers stands out, with some co-authoring more than 40 papers out of the total 8,446 papers presented across 197 conferences since 1989. These scholars are not only leading authors in terms of research output; they also serve as experts providing policy advice and play a central role in the research network through the mentoring and supervision of large numbers of Ph.D. students (Azoulay et al., 2010; Abbasi et al., 2011; Carrell et al., 2024). Alongside conference organizers, journal editors, and reviewers, these key researchers collectively shape the trajectory of digital economy research (Marquis and Tilcsik, 2013; Azoulay et al., 2019). The contributions of these pioneers are supported by resources from their home institutions and funding agencies, which enable them to conduct, present, and

disseminate their work.

5.1.5 Institutions and collaborations

Based on the information from conference programs and additional data collected about co-authors from Google Scholar and OpenAlex, I was able to determine the institution an author was affiliated with in a given year for a subset of the data.[22] In total, I identified 5,062 author-year combinations spanning 1989 and 2001 to 2024.

The data reveals a steady increase in the number of institutions contributing to digital economy research. Between 1989 and 2007, approximately 50 distinct institutions contributed annually. From 2007 onward, this number fluctuated between 100 and 200 institutions and peaked at 291 institutions in 2024, reflecting the continued expansion of the field.[23] More enabling institutions correlates with more conferences, an increase in papers presented per conference, and a growing number of authors contributing to the field (see Figure A.1). Figure A.3 further supports this trend. The left panel illustrates a strong increase in the number of authors per paper since 1998, rising from fewer than 1.5 authors per paper to nearly 3.5 authors by 2024.[24] Similarly, the right panel of Figure A.3 shows an upward trend in the number of institutions contributing to a single paper. While fluctuating around 1.7 institutions per paper during the consolidation stage, this number rose to about 2 in subsequent years and has continued its upward trajectory throughout the diversification stage. Together, these findings indicate that collaborations both within and across institutions are becoming increasingly important in digital economy research.

Figure A.4 depicts the development of intercontinental research collaborations. When digital economy research emerged, it was predominantly led by U.S. scholars, with limited international collaboration. During the consolidation stage, the field has become increasingly international, though U.S.-based researchers remain at the forefront. A notable increase in intercontinental collaborations occurred between 2008 and 2014, followed by a period of relative stability. By 2024, intercontinental collaborations constituted approximately 12% of all research contribu-

[22] For the analysis, I used only the first institution listed for each author per year, as it is likely their primary affiliation and main funding provider, while secondary institutions were excluded.

[23] The data shows a notable decline during the Covid-19 pandemic, reflecting disruptions caused by the global shift to remote work and the absence of physical conferences in many cases. However, this does not necessarily indicate a decrease in digital economy research during this period; rather, it highlights a reduction in the exchange of research outputs within conference settings.

[24] This figure likely represents the lower bound of the true number of co-authors, as many conference programs only list the presenting author, and some co-author information could not be retrieved from external sources such as Scholar and OpenAlex.

Figure 2: Relevance of institutions (1989, 2001 – 2024)



Note: The figure illustrates the cumulative weight of authors' institutions over time (1989, 2001 – 2024), based on 1,761 author-year combinations. The data was retrieved from all conferences listed in Table 1 and supplemented with additional co-author information from Google Scholar and OpenAlex. Due to missing institution data for the years 1990 – 2000, these years are excluded from the graph. Interactive version: https://sites.google.com/view/digital-economy-research.

tions. Moreover, the figures show a decline in intercontinental research collaborations during the COVID-19 pandemic, which aligns with the finding of Maher and Van Noorden (2021).

Furthermore, to illustrate the global dispersion of authors' institutions over time, I used ChatGPT-4.0 to identify the corresponding city, country, and geolocation (i.e., longitude and latitude). Figure 2 maps these institutions for 1,761 author-year combinations.[25] The figure shows the dominance of institutions in North America and Europe, which reflects two key factors: the ability of these institutions to attract top researchers from around the world and their substantial financial resources. On the one hand, these resources enable the repeated hosting of conferences at their institutions. On the other hand, they support high-quality research that meets stringent conference admission standards and facilitate researchers' participation in conferences worldwide, which further enhances their institutions' prominence in the field. The research institutions outside Europe and North America that stand out are Tel Aviv University and the National University of Singapore.

Overall, the number of institutions contributing to digital economy research has steadily grown, accompanied by an increase in research collaborations (Katz and Martin, 1997; Singh, 2005;

[25] Cumulative weights are used to highlight how certain institutions have gained prominence over the years. To account for differences in the number of institutions contributing to a single paper, I weighted each institution's contribution by dividing each paper by the number of co-authors.

Leahey, 2016). This broadening institutional base and geographical dispersion signals the maturation of the field. Yet the continued dominance of a small set of well-funded institutions in North America and Europe reflects persistent path dependencies in scientific production (David, 1994; Marquis and Tilcsik, 2013). As digital technologies connect the world, so too does research on the digital economy – but its full potential will only be realized if opportunities to contribute are equitably distributed across regions.

5.2 Interdisciplinarity of digital economy research

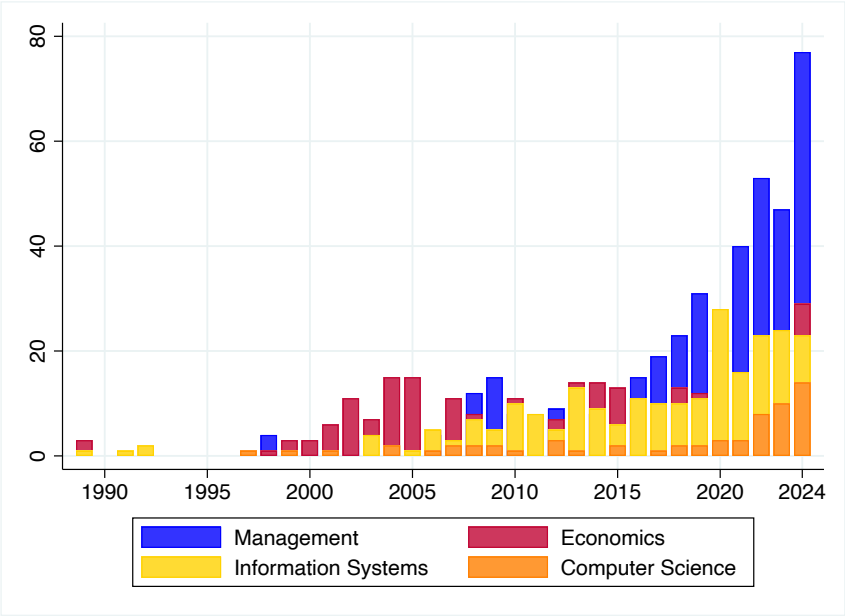
5.2.1 Authors and their departments

The research on the digital economy is an interdisciplinary field that integrates insights from computer science, economics, information systems, and management. One way to assess the relative dominance of these disciplines within the field is to analyze the departments in which the authors are employed. For papers available on Google Scholar, I was able to extract additional information for 1,756 authors (out of 4,161 authors with Google Scholar profiles).[26] Out of these authors, 767 provided detailed information about their professorships as of the end of 2024, enabling me to assign them to specific academic departments. Authors affiliated with business schools are classified under management, while more specific mentions of strategy or marketing are also taken into account. The results are summarized in Table A.1 in the Appendix.

For this subgroup of authors, the majority – over 60% (481 authors) – are employed in management departments, including those specialized in strategy and marketing. About 25% (181 authors) hold positions in economics departments, while nearly 10% (71 authors) are affiliated with information systems departments. Only 3.5% (26 authors) work in computer science departments, and a small group of 8 authors is employed in law schools. This distribution aligns closely with the journals where digital economy research is published, as scholars often aim to meet tenure requirements by publishing in journals associated with their disciplines (Rafols et al., 2012). However, there is also a strong presence of research in *Information Systems Research*, indicating that some management scholars publish in information systems outlets, reflecting overlapping interests and the high degree of interconnectivity among disciplines in the field.

[26] Notably, all missing profiles belong to authors who contributed to only one paper at one of the conferences. The extracted data is particularly robust for authors contributing to multiple papers across all conferences.

Figure 3: Evolution of disciplines over time (1989 – 2024)



Note: For 1,046 published papers in the dataset, journal information from Google Scholar enables classification into one of the four major disciplines. The y-axis shows the number of papers in each discipline, and the x-axis represents their publication year. Years without published papers have no bars in the figure.

5.2.2 Disciplines based on journal publications

Another way to understand the dominance and the evolution of certain disciplines in digital economy research over time is to analyze the journals where papers are published. Following the approach of Rietveld and Schilling (2021), I classify the main discipline of each paper based on journal information extracted from Google Scholar and the SSRN Economics of Networks eJournal. Of the 8,446 papers in the dataset, journal information is available for 3,285 papers. This includes 1,412 working papers and records from conference proceedings. In addition, using the first and most prominently displayed link to the journal on Google Scholar, I determine the publication domain. Among the papers analyzed, 1,530 are published in academic journals, including a smaller subset of 71 studies available via Google Books. Moreover, 167 journals publish both working papers and full articles; these papers are not classified as published. For 1,046 papers, I was able to categorize each into one of the four main disciplines based on the journal in which the final version was published.[27]

Figure 3 summarizes the results. The y-axis represents the number of papers published within

[27]The classification process relies on the journal's primary focus. For example, papers published in journals explicitly focused on economics are classified under the discipline *Economics*. For journals with a less distinct focus, such as the *Journal of Management Information Systems*, I assume that authors would likely have submitted the paper to a general management journal if it were not strongly related to information systems. Consequently, such papers are categorized under the discipline *Information Systems*.

each discipline per year. The figure reveals that during the emergence and early consolidation stages (prior to 2008), research on the digital economy was predominantly published in economics journals, while information systems journals gained prominence in the following years. Since the onset of the diversification stage in 2016, management journals have experienced a significant increase in publications and now dominate as outlets for digital economy research. Although information systems journals maintained a stable share for several years, their prominence has recently declined. In contrast, computer science journals have grown in importance, likely driven by rapid advancements in AI and the faster publication cycles typical of these journals. This trend highlights the interdisciplinary nature of digital economy research. Assuming that journals have not substantially increased the overall number of papers published, research on the digital economy seems to occupy an increasingly larger share of the academic publication landscape.

To be more precise, Table A.2 lists the ten most important journals, ranked by the total number of papers in the dataset published in them. At the top of the list are, *Management Science* and *Information Systems Research*. *Research Policy* ranks third, with a notably high mean citation count that highlights its relevance and broad scholarly impact. The inclusion of leading journals from various disciplines in the list underscores the success of digital economy research and demonstrates its ability to engage an interdisciplinary and diverse audience.

5.3 Changes in the research focus

5.3.1 The evolution of research topics

To identify meaningful patterns and trends in digital economy research, the available data support the application of natural language processing techniques. As a first step, I apply topic modeling to gain deeper insights into the evolution of specific research topics. Specifically, I use *BERTopic*, a state-of-the-art topic modeling technique based on the *BERT* NLP model (Egger and Yu, 2022). This method extracts meaningful topics and their representative keywords, providing interpretable insights into the data structure.[28] I employ a fine-tuned *BERT*-based approach in my analysis to ensure high performance and precision in identifying and categorizing

[28] *BERTopic* combines transformer models like *BERT* with dimensionality reduction methods like *UMAP* and clustering techniques such as *HDBSCAN* to identify topics in large text collections. It also employs a novel c-TF-IDF approach to extract topic representations. For a more detailed description of *BERTopic*, see https://maartengr.github.io/BERTopic/index.html.

patterns within the textual data.[29] Topic models perform best on full-text samples, as they leverage the entire context of the text to identify topics and patterns more effectively than when applied to shorter snippets, such as titles. Therefore, I include only those 6,881 papers in the analysis for which abstracts are available.[30] For a more detailed analysis, I focus on the five most frequent topics, which represent 94% of all papers with abstracts. To facilitate interpretation, I manually assign titles to each topic based on the five most frequent keywords associated with them. These topics, along with their corresponding keywords, are presented in Table A.3. Next, I calculate the average annual probability score for each topic based on the papers published in a given year. The results are illustrated in Figure 4.[31]

During the consolidation stage in the early 2000s, innovation questions dominated research on the digital economy. IP rights, closely tied to policy debates on piracy sparked by the rise of illegal file-sharing platforms such as Napster, played a prominent role (Rob and Waldfogel, 2006; Arora and Gambardella, 2010; Waldfogel, 2012; Bacache-Beauvallet et al., 2015; Reimers, 2016; Peukert et al., 2017; Ciarli et al., 2021; Bradley and Kolev, 2023). As the field matured, the thematic focus shifted from foundational innovation questions toward applications and broader societal impacts.[32] Across all stages, research on platforms has played a substantial role. Interest intensified around 2010, reflecting their growing economic significance and their prominence in competition policy and regulation debates, and has remained strong through the diversification stage (Parker et al., 2016; Rietveld and Schilling, 2021; Aguiar et al., 2023; Rong et al., 2023). The third-largest topic, represented by words such as *social, content, AI, users, media*, and *news*, shows a consistent upward trajectory, mirroring the rise of social media and AI in the

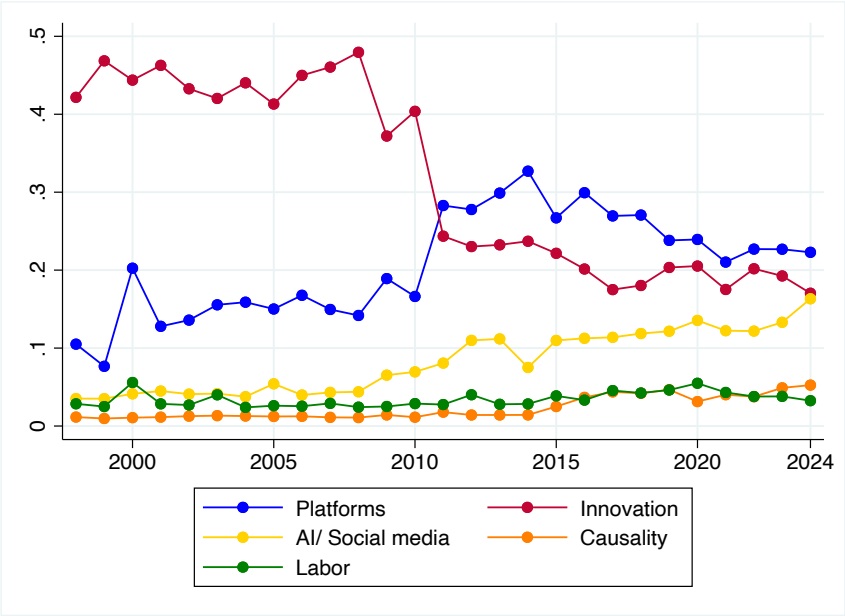
[29] So far, fine-tuned, smaller transformer-based LLMs continue to outperform generative AI models for specific and detailed text classification tasks (Bosley et al., 2023; Miric et al., 2023; Bucher and Martini, 2024; Edwards and Camacho-Collados, 2024). Given the rapid advancements in generative AI, future versions may surpass both fine-tuned models and human annotators (Gilardi et al., 2023; Zhong et al., 2023; Bucher and Martini, 2024).

[30] I configure the *BERTopic* model to reduce the number of topics to 10 by merging similar clusters, which aims to improve the coherence of the results. To prevent small, fragmented clusters, I set a minimum topic size of 20, meaning that any identified topic must contain at least 20 papers. After clustering, I use a *CountVectorizer* to remove English stop words and transform the text into a bag-of-words representation. This ensures that only meaningful words contribute to the topic representations. To refine the model further, I calculate topic probabilities, allowing each document to be associated with multiple topics based on the strength of its connection to them. Following the initial topic modeling, I address outlier papers – those that do not fit well into any topic – by reassigning them using a probability-based approach. This approach helps in associating atypical documents with the most relevant topic clusters based on their strongest probabilities. I then update the model's topic assignments to incorporate these adjustments, ensuring the final topics more accurately reflect the underlying patterns in the data.

[31] Due to limited data availability (fewer than nine papers with abstracts) for the years 1990 to 1997, I exclude these early years from the graph.

[32] The decrease in innovation research may also partially reflect the relative prominence – and subsequent decline – of papers presented at the DRUID conference in the dataset, as the field expanded and additional conferences emerged.

Figure 4: Evolution of top five topics in digital economy research (1998 – 2024)



Note: The figure illustrates the evolution of the average annual share of the five most frequent topics in digital economy research from 1998 to 2024. The y-axis represents the average annual probability score for each topic, based on papers published in a given year.

diversification stage. This thematic expansion also reflects public and policy concerns about misinformation, online content moderation, and the governance of data and AI (George and Waldfogel, 2006; Seamans and Zhu, 2014; Ahmed et al., 2023; Acemoglu et al., 2024; Aridor et al., 2024; Gans, 2024). When digital technologies first gained traction in the emergence stage, debates often focused on their implications for labor and productivity. Although the prominence of this topic declined for a period, it has re-emerged in recent years, driven by advancements in AI and concerns over automation and worker displacement (Gordon, 2000; Bresnahan et al., 2002; Brynjolfsson et al., 2019b, 2021; Foster-McGregor et al., 2021). Finally, since the mid 2010s, the growing emphasis on causal inference reflects the field's increasing methodological rigor and its relevance for evidence-based policymaking.

Taken together, the analysis reveals a clear shift in research topics across the three stages of the field's evolution. The emergence stage was inspired by technological breakthroughs and focused on understanding their economic and societal implications; the consolidation stage brought a turn toward applied and policy-relevant research concerning innovation and digital platforms; and the diversification stage has been marked by the dominance of platforms, the rise of social media and AI, and causal identification, all closely related to the field's engagement with societal and policy discussions.

5.3.2 Thematic shifts in digital economy research

As a second step, I use a structured text-mining approach to identify the most frequent terms in each year of the dataset and visualize them as yearly word clouds. This provides a complementary perspective to the BERTopic results as the word clouds highlight individual high-frequency terms that may capture emerging nuances or shifts not fully reflected in the topic model. For this analysis, I apply the *SpaCy* NLP library in Python to the titles and abstracts of all papers in the dataset.[33] Figure A.5 provides insights into the evolving research terms, showcasing word clouds for four exemplary years.[34]

In the emergence stage, digital economy research was dominated by economic questions focusing on *optimization, pricing*, and *information transmission*. These foundational topics laid the groundwork for assessing the economic implications of digital technologies, particularly in debates on market efficiency, competition, and the potential of the internet to reduce transaction costs (Bertschek and Kaiser, 2004). Over the 1990s, there was a shift toward more theoretical and modeling approaches aimed at developing frameworks for analyzing the emerging digital economy. By 2000, the most frequently occurring terms were *economy, market, firm, technology, digital*, and *growth*. This highlights a growing emphasis on the relationship between digital technologies and economic growth, as well as the role of firms and markets in shaping this transformation.

In the consolidation stage, the frequent appearance of *innovation* aligns with the corresponding BERTopic cluster, but the word clouds also reveal a stronger signal for terms related to consumer behavior. This indicates a gradual shift from a firm-centric lens toward the study of end-user adoption and digital consumptionan emphasis less distinct in the topic model but important for understanding policy debates on consumer welfare and inclusion.

[33] *SpaCy* identifies meaningful linguistic elements such as nouns, proper nouns, and adjectives, while filtering out stop words and non-alphabetical characters. Subsequently, I lemmatize the extracted terms to unify word variations and ensure consistency across the dataset. To focus on meaningful terms, I apply a frequency threshold, retaining only tokens that appear more than 20 times for further analysis. I then calculate token frequencies for each year to identify the most frequent terms, which are used to generate the yearly word clouds.
Pre-trained models, such as *SpaCy*, are trained on large datasets to recognize linguistic patterns, enabling tasks like word vector analysis and parts-of-speech tagging without requiring additional training.

[34] For this analysis, *BERTopic* is less suitable as it is trained on all papers, resulting in word clouds biased toward the most prominent topics across all years. Additionally, *BERTopic* is primarily designed for clustering texts into semantically coherent topics, making it less effective for extracting and visualizing high-frequency terms. In contrast, *SpaCy* offers the flexibility and precision required for token-based analysis, making it a more appropriate tool for this purpose.

As shown in the BERTopic results, *innovation* became a central theme during the consolidation stage, with research increasingly examining how technological advancements shape economic and organizational change. By 2010, dominant terms also included *firm, research*, and *knowledge*. At the same time, growing interest in consumer behavior signaled a shift from a primarily firm-centric perspective toward understanding the end users of digital technologies.

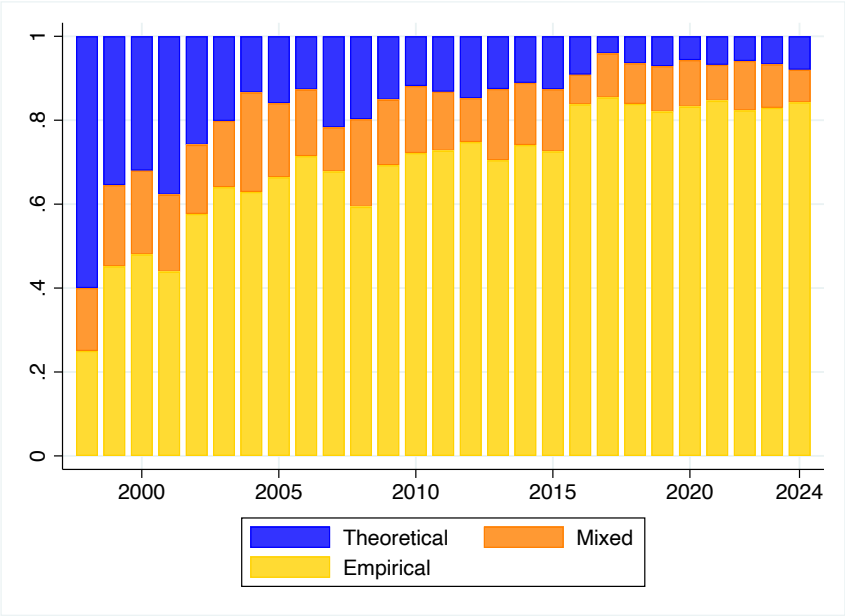
In the diversification stage (mid-2010s onward), platform-related terms dominated the field, echoing the BERTopic finding. This trend reflects the rapid expansion of platform-based business models and their growing role in antitrust investigations, competition policy, and regulation. The increasing appearance of terms related to causality and identification reflects the field's methodological maturation and its close ties to evidence-based policymaking.

Overall, the evolution of high-frequency terms across the three stages complements the topic modeling results: both approaches show a transition from foundational economic analyses to a more diverse set of questions, reflecting advances in digital technologies and shifts in societal and policy debates. Looking ahead, future research is likely to focus on generative AI, data governance, and the interaction between digital platforms and democratic institutions, as well as the environmental sustainability of digital infrastructures and the role of digital tools in tackling global challenges such as climate change and inequality.

5.3.3 Theoretical and empirical contributions

Authors often specialize in either theoretical or empirical research. Analyzing the distribution of these contributions is crucial for understanding shifts in research priorities and providing a clearer perspective on the trajectory of digital economy research. To systematically classify papers, I develop a keyword-based scoring approach using paper titles and abstracts. I define comprehensive keyword lists to distinguish between theoretical research, which develops conceptual or theoretical models; empirical research, which emphasizes data-driven (causal) estimation; and mixed research, which integrates theoretical frameworks with empirical validation. Theoretical keywords include terms such as *theory, concept, and framework*, while empirical keywords

Figure 5: Annual distribution of theoretical, empirical, and mixed papers (1998 – 2024)



Note: The figure shows the yearly share of 5,835 papers categorized as theoretical, empirical, or mixed. Unclassified papers were excluded from the analysis. Years before 1998 were excluded due to insufficient data.

include terms like *experiment, evidence, and measure.*[35]

Out of 8,446 papers, 4,519 are categorized as empirical, 627 as theoretical, and 715 as mixed, while the remaining papers could not be classified. To analyze temporal trends, I calculate the yearly share of papers in each category relative to the total number of classified papers. Figure 5 illustrates the evolving balance between theoretical and empirical research contributions, highlighting notable shifts over time. The figure reveals a clear decline in the share of theoretical works, which accounted for 60% of contributions in 1998, and a steady increase in empirical papers – a trend also observed in the broader economics literature and consistent with the findings from the word clouds (Hamermesh, 2013; Brice and Montesinos-Yufa, 2019). By

[35] All theoretical keywords are *theory, theoretical, framework, proposition, hypothesis, proof, concept, conceptual, assumption, paradigm, equilibrium, and model*; All empirical keywords are *empirical, evidence, experiment, measure, treatment, randomized, controlled, trial, measurement, survey, regression, panel, quantitative, qualitative, test, model, and data*; After testing model performance, I include *data* as an empirical keyword to minimize the number of unclassified papers. This does not affect the overall pattern. The word *model* appears in both lists to ensure relevant papers are not missed.
The classification function first applies stemming to unify word variations in paper titles and abstracts, and then calculates two scores based on the number of keywords per paper: one for theoretical keywords and one for empirical keywords. Papers are categorized as theoretical if the theoretical score exceeds the empirical score, empirical if the empirical score is higher, and mixed if both scores are equal. Papers with no matches for either set are labeled as unclassified, which typically occurs when abstracts are missing or very short. To validate the classification approach, I manually label a randomly selected subset of 100 papers. In this subset, 41% are categorized as empirical, 36% as theoretical, and 23% as mixed. Based on this labeled data, I calculate the error rate of the classification model by comparing the model's outputs with the manual labels. After excluding unclassified papers, the error rate is 37%, while recognizing the limitation that the manual labels themselves may also include inaccuracies. Using this approach, I apply the classification function to the full dataset.

Table 2: A conceptual framework for field evolution applied to digital economy research

Key Driver	Stage	Time Period	Disciplines	Research Focus	Field Characteristics
Pioneers	**Emergence**	1989–2000	Econ, CS	Economics of ICT, cost reduction, labor	Fragmented, scarce funding & data, theoretical exploration
Enablers	**Consolidation**	2001–2015	Econ, IS	Innovation, IP rights, platforms	Institutionalization, funding, data access, global dispersion
Engagement	**Diversification**	2016–present	Man, CS	Platforms, causality, social media, AI	Rapid growth, empirical validation

Note: Econ = Economics, CS = Computer Science, IS = Information Systems, Man = Management.

2016, the distribution stabilizes, with empirical papers comprising over 80%, theoretical papers around 7%, and mixed papers about 10%.

The decreasing share of theoretical contributions suggests that many foundational frameworks were established during the emergence stage. Since the consolidation stage, research has shifted toward applying these theories to real-world phenomena and empirical questions, driven by better data access and the need to inform policy. In sum, the analysis highlights the field's transition from theoretical exploration to empirical validation.

5.4 A conceptual framework for field evolution

Building on my findings from the research on the digital economy, I develop a conceptual framework for analyzing the evolution of research fields, which links temporal stages to their key drivers. The framework translates complex patterns of field evolution into a structured form that generalizes beyond the digital economy and can be applied to analyze other research fields. A research field evolves in three stages: emergence, consolidation, and diversification. Three primary drivers are central to the transition across stages: pioneers establish an initial research community; enablers convert early momentum into scale by providing financial, institutional, and data resources; and engagement with policy and society maintains attention, resources, and impact as the field diversifies. Table 2 summarizes this framework and applies it to digital economy research, specifying for each stage the time period, dominant disciplines, research foci, and field characteristics.

Digital economy research emerged (1989 – 2000) thanks to a number of pioneers – conference organizers and visionary scholars – who established the first platforms for scholarly exchange and set early research agendas. During this period, research was fragmented, with contributions coming primarily from economists and computer scientists. Funding and data availability were limited, so theoretical exploration dominated over empirical validation. Core topics included

the economic implications of ICT, cost reduction potentials, and labor-market effects.

The field transitioned into the consolidation stage (2001 – 2015) when enablers, such as institutions, funding agencies, and data providers, supplied the resources needed to scale. This support spurred a sharp increase in conferences worldwide, fostered intercontinental collaborations, and, through improved data access, enabled a shift toward empirical research. Economics and information systems dominated as the leading disciplines, focusing primarily on research related to innovation and digital platforms.

In the diversification stage (2016 – present), the field experienced strong growth, with management emerging as a dominant discipline. Empirical work, particularly studies employing causal identification, now leads the field, with core topics including platforms, social media, and AI. While engagement with societal and policy debates has been relevant throughout the field's evolution, it has become the defining driver in this stage. High-profile discussions on platform regulation, AI governance, and data privacy have significantly increased the field's visibility and policy relevance.

6 Discussion

Digital economy research demonstrates how fields evolve under rapid technological change. The findings of this study reveal key drivers that generalize to other domains, with implications for conference organizers, funding providers, policymakers, and editors.

First and foremost, pioneers, i.e. conference organizers and visionary scholars, are the most critical driver in establishing a research field. Their curiosity and willingness to invest time and energy in exploring new technologies lead them to create conferences as platforms for exchange and to set the early research agenda. Funding schemes should ensure that such individuals have the freedom to pursue these initiatives. These pioneers are vital to building an inclusive research community and mentoring PhD students and junior researchers. To further encourage such contributions, evaluation criteria for principal investigators should be extended beyond publication records to recognize achievements in community building and mentoring.

Second, enablers – institutions, funding agencies, and data providers – play a crucial role in expanding a research field. By providing the resources needed to organize conferences and support collaborative projects, they allow pioneers' initiatives to scale (see also Martin et al.

(2012)). Recent research budget cuts in several countries risk undermining such efforts.[36] A key challenge for enablers is to promote equitable global participation. The results of this study highlight the dominance of North America and Europe in conference hosting and scientific contributions. Researchers in underrepresented regions often face resource limitations and barriers to joining global academic networks (Merton, 1968; Jaffe et al., 1993; Sorenson and Fleming, 2004; Sorenson et al., 2006; Kahn and MacGarvie, 2016b). The surge of virtual conferences during the Covid-19 pandemic demonstrated their potential to reduce some of these disparities (Huenermund and Xu, 2024), allowing scholars from underrepresented regions to present their work and build networks. However, my analysis shows that intercontinental collaborations declined during the pandemic, indicating that structural barriers to participation persist (see also Maher and Van Noorden (2021)). Hybrid conference models offer a promising path forward, combining the inclusivity of virtual formats with the networking benefits of in-person meetings. Additional measures, such as rotating conference locations and offering travel or visa support and fee waivers, can help ensure that opportunities to contribute are more equitably distributed. Mentorship programs, targeted funding for scholars from underrepresented regions, and cross-regional collaborative projects can further bridge existing gaps. Equitable participation would not only democratize the research landscape but may also strengthen the field's capacity to address complex global policy issues such as platform governance, digital labor markets, and data privacy.

Third, engagement with societal debates and policymaking, is essential for ensuring that research remains relevant and impactful. Digital economy scholarship has been instrumental in informing discussions on digital regulation, competition policy, and data governance, contributing to major policy initiatives such as the EU General Data Protection Regulation (GDPR), the EU Digital Markets Act (DMA), the Digital Services Act (DSA), and the EU AI Act, as well as high-profile antitrust and copyright cases in the U.S. and the U.K. (Nardotto et al., 2015; Crémer et al., 2019; Gavazza et al., 2019; Cabral et al., 2021; Peukert et al., 2022; Galasso, 2023; Dubé et al., 2025; Lutes et al., 2025). Rigorous, credible advice to policymakers requires both strong theoretical foundations and robust empirical validation.

A major barrier to addressing key questions in the digital economy is the limited access to data

[36] See, for example, in the U.S. (https://www.nature.com/articles/d41586-025-01830-5, https://tinyurl.com/33bja38f), as well as Switzerland (https://www.snf.ch/en/9a7FhnojtA2AlWep/news/the-snsf-calls-for-budget-cuts-to-be-cancelled).

(Einav and Levin, 2014; Nagaraj et al., 2020; Schiersch and Ullrich, 2025). In this study, for example, restrictions by Google Scholar, the most widely used platform for academic research, highlight how platform gatekeeping can constrain scholarly work. Even when access is granted, strict data-sharing agreements may limit scientific freedom and the unrestricted publication of findings (Rotolo et al., 2022; Fišar et al., 2024). Similarly, external stakeholders enforcing political or commercial agendas on researchers may hinder independent inquiry. Overcoming these barriers requires stronger collaboration between academic institutions, policymakers, and industry leaders (Nightingale and Scott, 2007; Athey and Luca, 2019; Ahmed et al., 2023; Masclans et al., 2024; Baruffaldi and Poege, 2025). Regulatory measures, such as the EU DSA, offer promising solutions by mandating greater transparency and requiring platforms to share operational data. Complementary policies should improve knowledge exchange and support open science practices.

Timeliness is another critical challenge when academic research seeks to engage with policymaking. The pace of technological change often outstrips traditional academic publishing cycles, creating a lag between the emergence of new technologies and their systematic study in peer-reviewed research. For example, AI technologies evolve so rapidly that by the time a paper completes the typical multi-year review process in the social sciences, its findings may already be outdated. To address this, journals and editors should consider adopting faster publication cycles, similar to those in computer science, with expedited review processes. Some journals have already introduced specialized tracks for rapid publication of high-impact research, but there remains substantial room for improvement.

7 Conclusion

Looking back at the first evaluation of the NBER *Economics of Digitization* project in 2014, Shane Greenstein wrote: "We do not observe a research community to encourage high-quality and high-impact economic research that significantly reshapes academic and policy evaluation of the consequences of digitization" (Greenstein, 2014). A decade later, research on the digital economy has evolved into a dynamic, interdisciplinary field that plays a central role in evidence-based policymaking.

In this meta-study, I analyze the evolution of research on the digital economy, using a unique comprehensive dataset of 8,446 research papers presented at 197 conferences from 1989 to 2024. I

derive a conceptual framework that categorizes the field's evolution into three stages – emergence (1989 – 2000), consolidation (2001 – 2015), and diversification (2016 – present) – each driven by a key factor. The field first emerged driven by the initiatives of a few pioneers, who created conferences as platforms for exchange for economists and computer scientists to study the new digital technologies and its economic implications, cost reduction potentials, and labor-market effects. Due to limited funding and data, the research was theory-driven. In the consolidation stage, enablers – institutions, funding agencies, and data providers – drove the field's expansion. The global dispersion of conferences fostered collaborations and improved data access enabled a shift toward empirical research on innovation and digital platforms, led mainly by economists and information systems scholars. The diversification stage is defined by rapid growth in terms or conferences, papers, and research community. Management has become the leading discipline, while the field remains inherently interdisciplinary. The research focus is on causal empirical work on platforms, social media, and AI. While scholarly engagement with societal and policy debates has been relevant throughout the field's evolution, it has become the key driver. High-profile discussions on antitrust, data governance, and AI regulation have significantly increased the field's visibility and policy relevance.

Overall, this study contributes to a broader understanding of how knowledge evolves and diffuses by developing a conceptual framework for field evolution and showing how digital technologies have transformed academic thinking across disciplines. Unlike traditional literature reviews, it systematically analyzes decades of conference papers using advanced NLP and topic modeling to identify long-term thematic trends. Finally, it offers key takeaways: conference organizers and leading scholars should foster inclusive research communities, funding providers should expand support for interdisciplinary and global initiatives, policymakers should ensure data access and continuous knowledge exchange with academia, and editors should adapt publication cycles to keep pace with technological change. Together, these insights can guide the next stage of digital economy research.

The findings open up avenues for future research. The growing diversity and connectivity within the field invite further investigation into how digitization influences research inclusivity. While virtual conferences and international collaborations have lowered barriers, geographic and institutional disparities remain. Future studies could analyze strategies for closing these gaps. Another avenue is to study how data access shapes innovation and research quality. Proprietary

datasets from industry collaborations offer unique opportunities but often come with restrictions that limit academic freedom. Regulatory initiatives, such as the EU DSA, may open new opportunities for accessing firm-level data, particularly in the EU. Future research could explore models for partnerships that balance proprietary data use with open science principles. Finally, comparative studies between the digital economy and more siloed research fields could yield insights into how interdisciplinarity influences methodologies, topics, and community.

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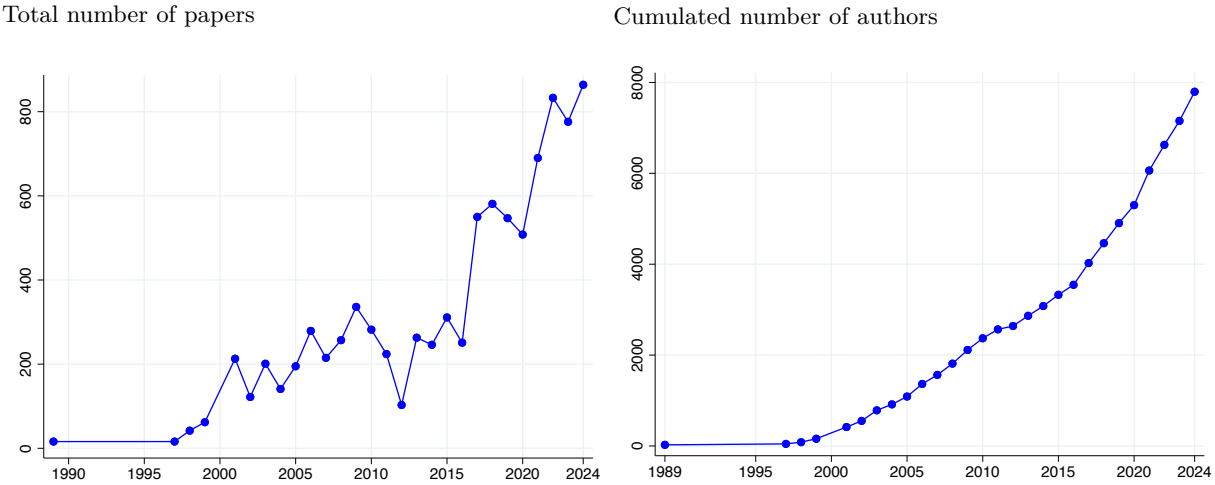
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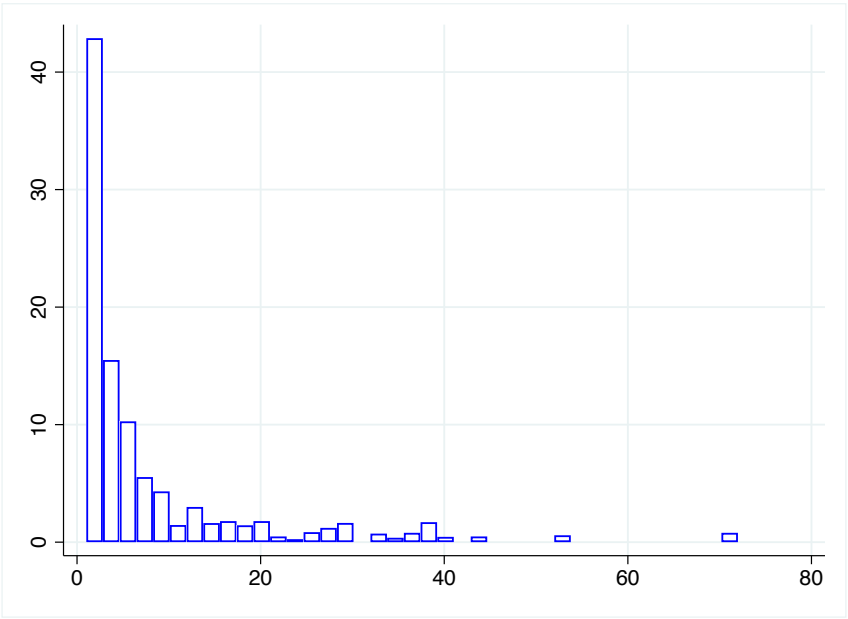
Appendix

Figure A.1: Growth in digital economy research



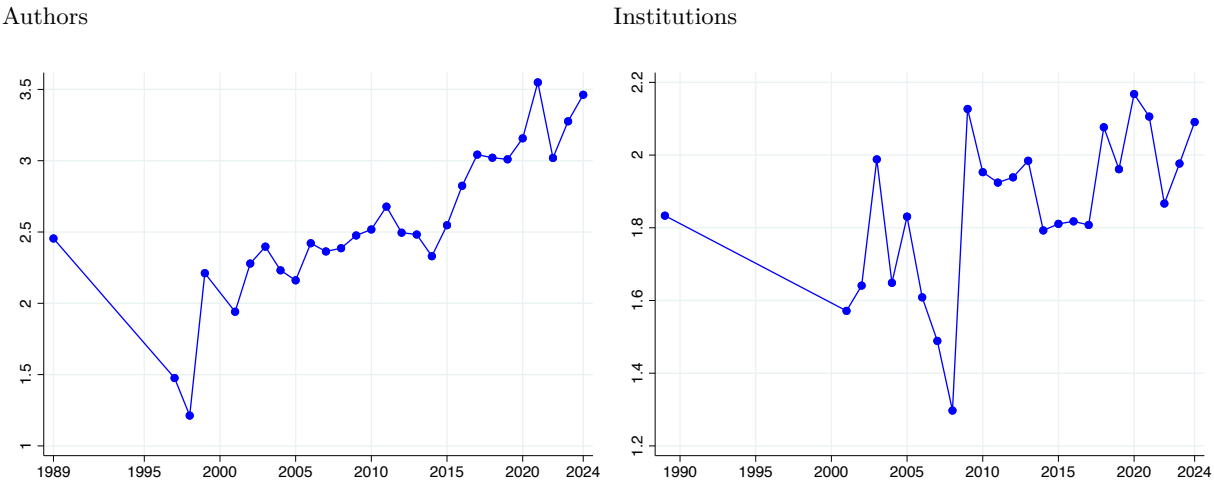
Note: In the left panel, the figure shows the total annual number of papers presented across all conferences listed in Table 1. In the right panel, the figure shows the cumulated number of scholars in the field over time. Years for which data is available are marked with a dot.

Figure A.2: Distribution of the total number of papers per author (1989 – 2024)



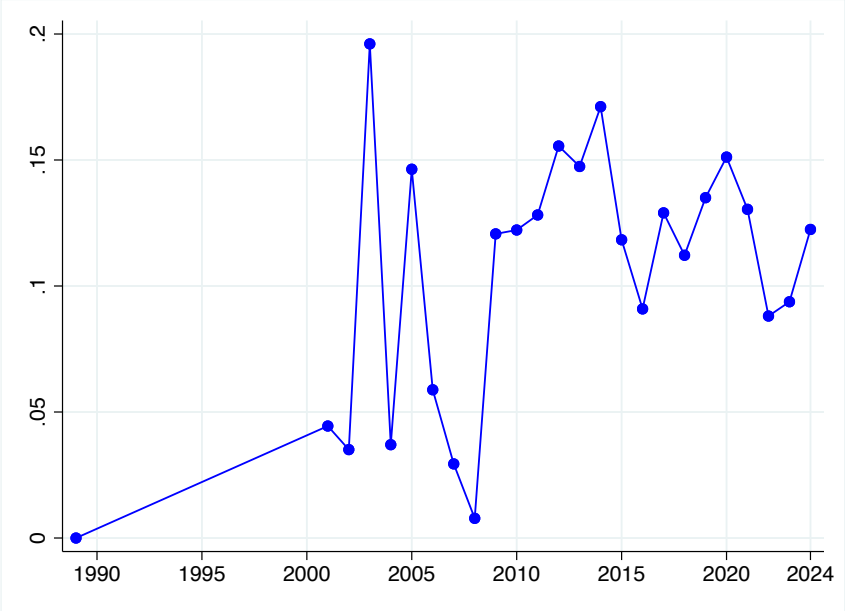
Note: The figure shows the frequency distribution of the total number of papers authored by each individual across all conferences.

Figure A.3: Average number of authors and institutions per paper



Note: The left panel shows the average number of authors contributing to a paper each year. The right panel shows the average number of institutions contributing to a paper each year. Years for which data is available are marked with a dot.

Figure A.4: Yearly share of intercontinental collaborations

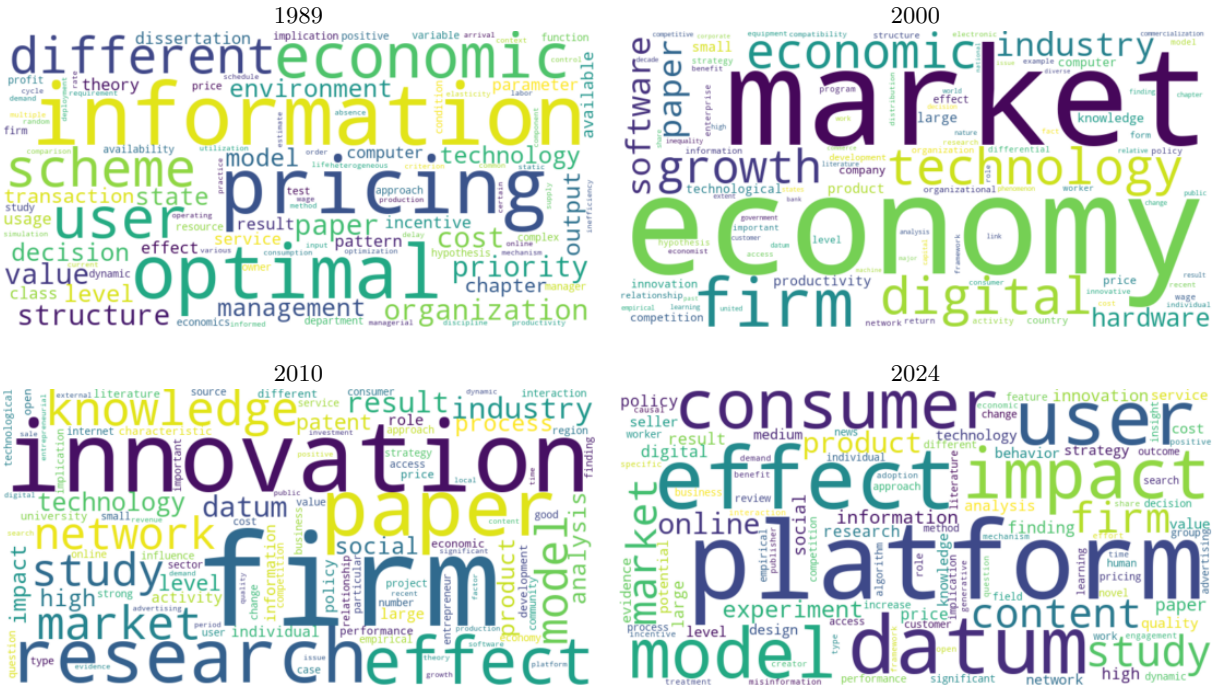


Note: The figure shows the average annual share of intercontinental collaborations from 1989 to 2024. Years for which data is available are marked with a dot.

Table A.1: Departments of authors

Department	Frequency	Share
Management	408	53.19
Marketing	40	5.22
Strategy	33	4.30
Economics	181	23.60
Information Systems	71	9.26
Computer Science	26	3.39
Law	8	1.04
Total	767	100.00

Figure A.5: Word clouds for the years 1989, 2000, 2010, and 2024



Note: Remaining years and interactive version: https://sites.google.com/view/digital-economy-research.

Table A.2: Most frequent journals

Rank	Journal	Number of papers	Mean citations
1	Management Science	94	143
2	Information Systems Research	93	121
3	Research Policy	50	457
4	MIS Quarterly	40	209
5	Marketing Science	26	202
6	Journal of Management Information Systems	15	117
7	The RAND Journal of Economics	15	74
8	Industry and Innovation	14	298
9	Nature	11	500
Total publications		1530	176

Note: The table lists the most frequent journals in which digital economy research is published. It shows how many papers are published in each of the journals and their mean number of citations on Google Scholar. Citation information is only available for 1,491 out of the 1,530 published papers.

Table A.3: Top 5 topics and their corresponding keywords

#	Topic	Keywords
1	Platforms	platform, data, consumers, market, online
2	Innovation	firms, innovation, knowledge, paper, research
3	AI/Social media	social, content, ai, users, media
4	Causality	experiments, treatment, effects, causal, randomized
5	Labor	job, labor, workers, employers, gender