Artificial Intelligence and Entrepreneurship

Other titles in Foundations and Trends® in Entrepreneurship

Building Entrepreneurial Ecosystems Sustainably
Christina Theodoraki
ISBN: 978-1-63828-386-7

Generative AI in Entrepreneurship Research: Principles and Practical Guidance for Intelligence Augmentation
Francesco Ferrati, Phillip H. Kim and Moreno Muffatto
ISBN: 978-1-63828-384-3

Entrepreneurs' Search for Sources of Knowledge
Albert N. Link
ISBN: 978-1-63828-296-9

The Evolution of Hidden Champions as Niche Entrepreneurs
Erik E. Lehmann and Julian Schenkenhofer
ISBN: 978-1-63828-258-7

Entrepreneurship in the Long-Run: Empirical Evidence and Historical Mechanisms
Michael Fritsch and Michael Wyrwich
ISBN: 978-1-63828-108-5

Minority Entrepreneurship 2.0
Timothy Bates
ISBN: 978-1-63828-048-4

Artificial Intelligence and Entrepreneurship

Frank M. Fossen
University of Nevada-Reno
ffossen@unr.edu

Trevor McLemore
University of Nevada-Reno
tmclemore@unr.edu

Alina Sorgner
John Cabot University
asorgner@johncabot.edu

now
the essence of knowledge
Boston — Delft

Foundations and Trends® in Entrepreneurship

Published, sold and distributed by:
now Publishers Inc.
PO Box 1024
Hanover, MA 02339
United States
Tel. +1-781-985-4510
www.nowpublishers.com
sales@nowpublishers.com

Outside North America:
now Publishers Inc.
PO Box 179
2600 AD Delft
The Netherlands
Tel. +31-6-51115274

The preferred citation for this publication is

F. M. Fossen *et al.*. *Artificial Intelligence and Entrepreneurship*. Foundations and Trends® in Entrepreneurship, vol. 20, no. 8, pp. 781–904, 2024.

ISBN: 978-1-63828-451-2

Foundations and Trends® in Entrepreneurship
Volume 20, Issue 8, 2024

Editorial Board

Editorial Scope

Foundations and Trends® in Entrepreneurship publishes survey and tutorial articles in the following topics:

- Nascent and start-up entrepreneurs
- Opportunity recognition
- New venture creation process
- Business formation
- Firm ownership
- Market value and firm growth
- Franchising
- Managerial characteristics and behavior of entrepreneurs
- Strategic alliances and networks
- Government programs and public policy
- Gender and ethnicity
- New business financing:
  - Business angels
  - Bank financing, debt, and trade credit
  - Venture capital and private equity capital
  - Public equity and IPOs
- Family-owned firms
- Management structure, governance and performance
- Corporate entrepreneurship
- High technology:
  - Technology-based new firms
  - High-tech clusters
- Small business and economic growth

Information for Librarians

Foundations and Trends® in Entrepreneurship, 2024, Volume 20, 4 issues. ISSN paper version 1551-3114. ISSN online version 1551-3122. Also available as a combined paper and online subscription.

Contents

Artificial Intelligence and Entrepreneurship

Frank M. Fossen[1], Trevor McLemore[2] and Alina Sorgner[3]

[1]*Department of Economics, University of Nevada-Reno, USA, and IZA, Germany; ffossen@unr.edu*
[2]*Department of Economics, University of Nevada-Reno, USA; tmclemore@unr.edu*
[3]*John Cabot University, Italy; Kiel Institute for the World Economy (IfW Kiel), and IZA, Germany; asorgner@johncabot.edu*

ABSTRACT

Advances in artificial intelligence (AI) have brought the world to the threshold of significant new technological breakthroughs. These developments bring new opportunities and challenges to existing and potential entrepreneurs, raising pressing and promising research questions. We review emerging but fast-growing literature on impacts of AI on entrepreneurship, providing a resource for researchers in entrepreneurship and neighboring disciplines. We begin with a review of definitions of AI and show that ambiguity and broadness of definitions adopted in empirical studies may result in obscured evidence on impacts of AI on entrepreneurship. Against this background, we present and discuss existing theories and evidence on how AI technologies affect entrepreneurial opportunities and decision-making under uncertainty, the adoption of AI technologies by startups, entry barriers, and the performance of entrepreneurial businesses. We add an original empirical analysis of survey data

Frank M. Fossen, Trevor McLemore and Alina Sorgner (2024), "Artificial Intelligence and Entrepreneurship", Foundations and Trends® in Entrepreneurship: Vol. 20, No. 8, pp 781–904. DOI: 10.1561/0300000130.

from the German Socio-economic Panel revealing that entrepreneurs, particularly those with employees, are aware of and use AI technologies significantly more frequently than paid employees. Next, we discuss how AI may affect entrepreneurship indirectly through impacting local and sectoral labor markets. The reviewed evidence suggests that AI technologies that are designed to automate jobs are likely to result in a higher level of necessity entrepreneurship in a region, whereas AI technologies that transform jobs without necessarily displacing human workers increase the level of opportunity entrepreneurship. More generally, AI impacts regional entrepreneurship ecosystems (EE) in multiple ways by altering the importance of existing EE elements and processes, creating new ones, and potentially reducing the role of geography for entrepreneurship. Lastly, we address the question of how the regulation of AI may affect the entrepreneurship landscape by focusing on the case of the European Union and its data protection and AI legislation. We conclude our survey by discussing implications for entrepreneurship research and policy.

Keywords: Artificial intelligence; machine learning; entrepreneurship; AI startups; digital entrepreneurship; opportunity; innovation; entrepreneurship ecosystem; digital entrepreneurship ecosystem; AI regulation.

JEL Codes: J24, L26, O30.

1

Introduction

Artificial Intelligence (AI) transforms, destroys and creates human occupations and brings new opportunities and challenges to existing and potential entrepreneurs. AI may create new business opportunities for entrepreneurs (Shepherd and Majchrzak, 2022), but also push individuals into self-employment whose prior wage jobs are automated through the implementation of AI. AI startups such as DeepL are developing AI products that seem to be able to compete against tech giants like Amazon or Google (Weber *et al.*, 2022). At the same time, other self-employed individuals and independent contractors feel threatened, such as writers in Hollywood, whose 2023 strike was partially motivated by concerns that studios may employ AI to create movie and television scripts.

In a Delphi study, Van Gelderen *et al.* (2021) asked 175 editors and Editorial Review Board members of the academic journals *Entrepreneurship Theory and Practice* (ETP) and *Journal of Business Venturing* what they think entrepreneurship will look like in 2030. AI is among the themes mentioned most often by the experts.[1] The authors

[1] We note that AI is not a new phenomenon. A search for the terms "AI" and "artificial intelligence" using the Google Ngram Viewer tool and the corpus of English publications reveals that there was a significant increase in the interest in AI already

conclude that one of the main future research questions in the field of entrepreneurship concerns how AI may affect the types of entrepreneurial ventures emerging and their performance. In particular, they raise the questions of how, why, and under what conditions AI might complement and support entrepreneurial activity or substitute for entrepreneurial judgement, perhaps even replacing the entrepreneur in the future.[2] While the literature on the AI-entrepreneurship nexus started before 2020, the global Covid-19 pandemic crisis substantially contributed to the spread of digital technologies and also spurred research on the impacts of AI on startups (Sorgner, 2023).

In this review, we discuss how extant literature in multiple disciplines including economics and management describes the direct and indirect impacts of AI on entrepreneurship. We start our survey with a discussion of common definitions of AI and argue that wording matters for designing empirical research as well as government regulation of AI.

In terms of direct impact, AI technologies have been identified as external enablers and facilitators of entrepreneurship (Davidsson *et al.*, 2020; Obschonka and Audretsch, 2020; Chalmers *et al.*, 2021; Davidsson and Sufyan, 2023). Innovative entrepreneurs discover and create new business opportunities using AI, and AI may reduce costs such as labor costs (through automation) and financing costs (through fintech services). Due to their prediction abilities, AI systems may help to resolve challenges of uncertainty and thereby create new possibilities of entrepreneurial action (Townsend and Hunt, 2019), but AI may also have fundamental limitations in dealing with uncertainty (Townsend *et al.*, 2023). Recent literature reports that AI deployment has become increasingly important in the development of digital entrepreneurship, in identifying and acquiring knowledge, in customizing products and services as a competitive entrepreneurial strategy, and in managing product innovation (Mariani *et al.*, 2023). Generative AI such as ChatGPT can

during the 1960s, with a further surge in the 1980s culminating at around 1986. After that year, a strong decline in the trend followed that stabilized during the 1990s. A recent and still ongoing trend of an exponentially growing interest in AI started roughly after the year 2014.

[2] A call for paper proposals for a special issue of ETP on transformative AI and entrepreneurship is open until January 31, 2026 (https://www.entrepreneurship-ex-machina.org/).

support creative tasks such as pitching entrepreneurial business ideas to investors or generating business ideas (Short and Short, 2023; Boussioux *et al.*, 2024). An important emerging theme is that AI plays a key role in (digital) entrepreneurial ecosystems (Acs *et al.*, 2022; Wurth *et al.*, 2023) by facilitating information sharing, creating and diffusing new products, and fostering innovation.

Due to the novelty of the phenomenon, most papers on the AI-entrepreneurship nexus have been conceptual, while few papers present evidence from surveys (e.g., Bessen *et al.*, 2022; McElheran *et al.*, 2024) or experiments (e.g., Otis *et al.*, 2024). In this review, we supplement this literature by providing new survey evidence on how the self-employed use AI and are exposed to AI based on the German Socio-economic Panel (Fedorets *et al.*, 2022).

Advances in AI may also have indirect impacts on entrepreneurship when AI affects the labor market more broadly. Some individuals are pushed into self-employment due to a lack of alternatives available to them. The number of such necessity entrepreneurs may increase if jobs are automated and workers are displaced by AI. We discuss various empirical measures of the impact of AI on occupations and continue by reviewing evidence of consequences of AI for the labor market and entry into different types of entrepreneurship (Fossen and Sorgner, 2021, 2022). As AI affects occupations, the impacts vary across regions depending on regional occupational structures, which creates challenges and opportunities for regional policymaking (Fossen *et al.*, 2022a). The rapid advances made in AI technologies, which have raised many concerns about the future of work, have led many countries and regions, most notably the European Union, to develop and implement sometimes very strict regulations of AI. We discuss likely impacts on the level and nature of AI entrepreneurship.

We conclude our review by deriving central questions for future entrepreneurship research. Do emerging government regulations of AI support entrepreneurs or keep them from achieving their goals? What are the right conditions – in terms of an entrepreneurial ecosystem – that allow entrepreneurs to put AI to beneficial use and to avoid potential harm to society? (Baumol, 1996) With our review we aim to take stock of what scholars have learned about the impact of AI on entrepreneurship,

discuss potential policy implications, identify knowledge gaps, and provide avenues for further research in this rapidly growing research area.

The scope of this review is defined by the various impacts AI may have on entrepreneurship. Obschonka and Fisch (2022) identify two main areas of intersection between AI and entrepreneurship research: AI in entrepreneurship as a research topic and AI as a research method. We delve deeply into the first area, but do not cover the potential of AI to be used as a new method in entrepreneurship research. We refer the readers to Lévesque *et al.* (2022), who investigate this topic (see also Schwab and Zhang, 2019; Lamine *et al.*, 2023). Implications of AI for entrepreneurship education are also outside the scope of this survey. Obschonka and Audretsch (2020) identify this as an important research area, and Winkler *et al.* (2023) offer significant inroads. Finally, we do not include AI in entrepreneurial finance in this review; Ferrati and Muffatto (2021) provide an extensive survey of emerging machine learning approaches in entrepreneurial finance (see also Bertoni *et al.*, 2022).

This review is structured as follows. Section 2 reviews existing and the most widely used definitions of AI and provides an overview of various types of AI technologies and their applications. Section 3 reviews the literature on the AI-entrepreneurship nexus that deals with the concepts of entrepreneurial uncertainty, opportunity, decision-making, and performance. Section 4 presents initial empirical evidence on AI adoption and usage by entrepreneurial businesses and complements it with our own novel analysis of survey data from the German Socio-economic Panel. Section 5 reviews evidence on the indirect effects of AI on entrepreneurship through local labor markets. Section 6 discusses impacts of AI on entrepreneurship ecosystems. Section 7 presents the current regulations of AI, with a focus on the EU, and discusses their potential impacts on the entrepreneurship landscape. Section 8 highlights insights from our review and discusses implications for entrepreneurship research and policy. Finally, Section 9 concludes the survey.

References

Acemoglu, D. and P. Restrepo (2018a). "The race between man and machine: Implications of technology for growth, factor shares, and employment". *American Economic Review*. 108(6): 1488–1542.

Acemoglu, D. and P. Restrepo (2018b). "Artificial intelligence, automation, and work". In: *The Economics of Artificial Intelligence: An Agenda, NBER Book*. Ed. by A. K. Agrawal, J. Gans, and A. Goldfarb. URL: https://www.nber.org/chapters/c14027.

Acemoglu, D. and P. Restrepo (2019). "Automation and new tasks: How technology displaces and reinstates labor". *Journal of Economic Perspectives*. 33(2): 3–30.

Acemoglu, D., D. Autor, J. Hazell, and P. Restrepo (2022). "Artificial intelligence and jobs: Evidence from online vacancies". *Journal of Labor Economics*. 40(S1): S293–S340.

Acs, Z. J., E. Autio, and L. Szerb (2015). "National systems of entrepreneurship: Measurement issues and policy implications". *Global Entrepreneurship, Institutions and Incentives*: 523–541.

Acs, Z. J., L. Szerb, A. Song, E. Lafuente, and E. Komlosi (2022). "Measuring the digital platform economy". In: *Handbook of Digital Entrepreneurship*. Ed. by M. Keyhani, T. Kollmann, A. Ashjari, A. Sorgner, and C. E. Hull. Edward Elgar Publishing.

Aghion, P., B. Jones, and C. Jones (2019). "Artificial intelligence and economic growth". In: *The Economics of Artificial Intelligence: An Agenda*. Ed. by A. Agrawal, J. Gans, and A. Goldfarb. Chicago: University of Chicago Press. 237–290.

Agrawal, A., J. S. Gans, and A. Goldfarb (2019). "Artificial intelligence: The ambiguous labor market impact of automating prediction". *Journal of Economic Perspectives*. 33(2): 31–50.

Agrawal, A., J. S. Gans, and S. Stern (2021). "Enabling entrepreneurial choice". *Management Science*. 67(9): 5510–5524.

Agrawal, A., J. McHale, and A. Oettl (2024). "Artificial intelligence and scientific discovery: A model of prioritized search". *Research Policy*. 53(5): 104989.

Alexopoulos, M. and J. Cohen (2018). "Canadian productivity growth, secular stagnation, and technological change". *International Productivity Monitor*. (35): 113–137.

Arntz, M., T. Gregory, and U. Zierahn (2017). "Revisiting the risk of automation". *Economics Letters*. 159: 157–160.

Åstebro, T., H. Herz, R. Nanda, and R. A. Weber (2014). "Seeking the roots of entrepreneurship: Insights from behavioral economics". *Journal of Economic Perspectives*. 28(3): 49–70.

Åstebro, T. and J. Tåg (2017). "Gross, net, and new job creation by entrepreneurs". *Journal of Business Venturing Insights*. 8: 64–70.

Audretsch, D. B. and M. Belitski (2017). "Entrepreneurial ecosystems in cities: Establishing the framework conditions". *The Journal of Technology Transfer*. 42: 1030–1051.

Autio, E., L. Szerb, E. Komlósi, and M. Tiszberger (2018). *The European Index of Digital Entrepreneurship Systems,* EUR 29309 EN. Luxembourg: Publications Office of the European Union. DOI: 10.2760/39256.

Autor, D. H. (2015). "Why are there still so many jobs? The history and future of workplace automation". *Journal of Economic Perspectives*. 29(3): 3–30.

Autor, D., D. Dorn, L. F. Katz, C. Patterson, and J. Van Reenen (2020). "The fall of the labor share and the rise of superstar firms". *Quarterly Journal of Economics*. 135(2): 645–709.

Babina, T., A. Fedyk, A. He, and J. Hodson (2024). "Artificial intelligence, firm growth, and product innovation". *Journal of Financial Economics*. 151: 103745.

Bachmann, R., M. Gonschor, S. Milasi, and A. Mitra (2024). "Technological progress and the dynamics of self-employment: Worker-level evidence for Europe". *International Labour Review* (Forthcoming).

Bajari, P., V. Chernozhukov, A. Hortaçsu, and J. Suzuki (2019). "The impact of big data on firm performance: An empirical investigation". *AEA Papers and Proceedings*. 109: 33–37.

Baumol, W. J. (1996). "Entrepreneurship: Productive, unproductive, and destructive". *Journal of Business Venturing*. 11(1): 3–22.

Bejjani, M., L. Göcke, and M. Menter (2023). "Digital entrepreneurial ecosystems: A systematic literature review". *Technological Forecasting & Social Change*. 189: 122372.

Benz, M. and B. S. Frey (2008). "Being independent is a great thing: Subjective evaluations of self-employment and hierarchy". *Economica*. 75(298): 362–383.

Beraja, M., A. Kao, D. Y. Yang, and N. Yuchtman (2023). "AI-tocracy". *The Quarterly Journal of Economics*. 138(3): 1349–1402.

Berger, E. S., F. Von Briel, P. Davidsson, and A. Kuckertz (2021). "Digital or not—The future of entrepreneurship and innovation: Introduction to the special issue". *Journal of Business Research*. 125: 436–442.

Bertoni, F., S. Bonini, V. Capizzi, M. G. Colombo, and S. Manigart (2022). "Digitization in the market for entrepreneurial finance: Innovative business models and new financing channels". *Entrepreneurship Theory and Practice*. 46(5): 1120–1135.

Bessen, J. E., S. M. Impink, L. Reichensperger, and R. Seamans (2020). GDPR and the importance of data to AI startups. *Working Paper*. URL: https://ssrn.com/abstract=3576714.

Bessen, J., S. M. Impink, L. Reichensperger, and R. Seamans (2022). "The role of data for AI startup growth". *Research Policy*. 51(5): 104513.

Bessen, J. E., S. M. Impink, L. Reichensperger, and R. Seamans (2023a). The business of AI startups. *Working Paper*. URL: https://ssrn.com/abstract=3293275.

Bessen, J. E., S. M. Impink, and R. Seamans (2023b). The role of ethical principles in AI startups. *Working Paper*. URL: https://ssrn.com/abstract=4378280.

Bessen, J. E., I. Cockburn, and J. Hunt (2023c). Is distance from innovation a barrier to the adoption of artificial intelligence? *Working Paper*. URL: https://www.jenniferhunt.org/uploads/ai-diffusion-230829-lores.pdf.

Bickley, S. J., A. Macintyre, and B. Torgler (2024). "Artificial intelligence and big data in sustainable entrepreneurship". *Journal of Economic Surveys*. DOI: 10.1111/joes.12611.

Blinder, A. S. and A. B. Krueger (2013). "Alternative measures of offshorability: A survey approach". *Journal of Labor Economics*. 31(S1): S97–S128.

Block, J. and P. Sandner (2009). "Necessity and opportunity entrepreneurs and their duration in self-employment: Evidence from German micro data". *Journal of Industry, Competition and Trade*. 9: 117–137.

Block, J. and M. Wagner (2010). "Necessity and opportunity entrepreneurs in Germany: Characteristics and earnings differentials". *Schmalenbach Business Review*. 62(2): 154–174.

Blohm, I., T. Antretter, C. Sirén, D. Grichnik, and J. Wincent (2022). "It's a peoples game, isn't it?! A comparison between the investment returns of business angels and machine learning algorithms". *Entrepreneurship Theory and Practice*. 46(4): 1054–1091.

Boeri, T., G. Giupponi, A. B. Krueger, and S. Machin (2020). "Solo self-employment and alternative work arrangements: A cross-country perspective on the changing composition of jobs". *Journal of Economic Perspectives*. 34(1): 170–195.

Bonney, K., C. Breaux, C. Buffington, E. Dinlersoz, L. S. Foster, N. Goldschlag, J. C. Haltiwanger, Z. Kroff, and K. Savage (2024). Tracking firm use of AI in real time: A snapshot from the Business Trends and Outlook Survey. *NBER Working Paper w32319,* National Bureau of Economic Research.

Bosma, N. (2013). "The Global Entrepreneurship Monitor (GEM) and its impact on entrepreneurship research". *Foundations and Trends in Entrepreneurship*. 9(2): 143–248.

Boucher, P. N. (2020). "Artificial intelligence: How does it work, why does it matter, and what can we do about it?"

Boussioux, L., J. N. Lane, M. Zhang, V. Jacimovic, and K. R. Lakhani (2024). "Generative AI and creative problem solving". Harvard Business School Technology & Operations Mgt. *Unit Working Paper No. 24-005*. DOI: 10.2139/ssrn.4533642.

Brock, J. K. U. and F. von Wangenheim (2019). "Demystifying AI: What digital transformation leaders can teach you about realistic artificial intelligence". *California Management Review*. 61(4): 110–134.

Brown, P. (2021). "Improving customer interactions with AI-based avatars". URL: https://electronics360.globalspec.com/article/17568/improving-customer-interactions-with-ai-based-avatars.

Brown, T. E. (2017). "Sensor-based entrepreneurship: A framework for developing new products and services". *Business Horizons*. 60(6): 819–830.

Brynjolfsson, E. and T. Mitchell (2017). "What can machine learning do? Workforce implications". *Science*. 358(6370): 1530–1534.

Brynjolfsson, E., T. Mitchell, and D. Rock (2018). "What can machines learn and what does it mean for occupations and the economy?" *AEA Papers and Proceedings*. 108: 43–47.

Brynjolfsson, E., D. Rock, and C. Syverson (2019). "Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics". In: *The Economics of Artificial Intelligence: An Agenda*. Ed. by A. Agrawal, J. Gans, and A. Goldfarb. Chicago: University of Chicago Press. 23–60.

Brynjolfsson, E., D. Li, and L. R. Raymond (2023). Generative AI at work. *NBER Working Paper w31161,* National Bureau of Economic Research.

Brynjolfsson, E., T. Mitchell, I. Rahwan, S. H. Bana, D. Rock, and M. Frank (2024). "Suitability for machine learning rubric (WorldSML)". URL: https://digitaleconomy.stanford.edu/research/suitability-for-machine-learning-rubric-worldsml/.

Bubeck, S., V. Chandrasekaran, R. Eldan, J. Gehrke, E. Horvitz, E. Kamar, and Y. Zhang (2023). "Sparks of artificial general intelligence: Early experiments with GPT-4". *arXiv preprint arXiv:2303.12712*.

Burton, M. D., M. G. Colombo, C. Rossi-Lamastra, and N. Wasserman (2019). "The organizational design of entrepreneurial ventures". *Strategic Entrepreneurship Journal*. 13(3): 243–255. DOI: 10.1002/sej.1332.

Bylund, P. L. and M. McCaffrey (2017). "A theory of entrepreneurship and institutional uncertainty". *Journal of Business Venturing*. 32: 461–475.

Caliendo, M., F. Fossen, and A. Kritikos (2012). "Trust, positive reciprocity, and negative reciprocity: Do these traits impact entrepreneurial dynamics?" *Journal of Economic Psychology*. 33(2): 394–409.

Caliendo, M. and A. S. Kritikos (2019). "'I want to, but I also need to': Start-ups resulting from opportunity and necessity". In: *From Industrial Organization to Entrepreneurship: A Tribute to David B. Audretsch*. Ed. by E. E. Lehmann and M. Keilbach. New York: Springer. 247–265.

Caliendo, M., F. M. Fossen, and A. S. Kritikos (2022). "Personality characteristics and the decision to hire". *Industrial and Corporate Change*. 31(3): 736–761.

Camuffo, A., A. Cordova, A. Gambardella, and C. Spina (2020). "A scientific approach to entrepreneurial decision making: Evidence from a randomized control trial". *Management Science*. 66(2): 564–586.

Carbonero, F., J. Davies, E. Ernst, F. M. Fossen, D. Samaan, and A. Sorgner (2023). "The impact of artificial intelligence on labor markets in developing countries: A new method with an illustration for Lao PDR and urban Viet Nam". *Journal of Evolutionary Economics*. 33(3): 707–736.

Casas, P. and C. Román (2023). "Early retired or automatized? Evidence from the survey of health, ageing and retirement in Europe". *The Journal of the Economics of Ageing*. 24: 100443.

Cetindamar, D., T. Lamers, and Y. Zhang (2020). "Exploring the knowledge spillovers of a technology in an entrepreneurial ecosystem—The case of artificial intelligence in Sydney". *Thunderbird International Business Review*. 62: 457–474.

Chalmers, D., N. G. MacKenzie, and S. Carter (2021). "Artificial intelligence and entrepreneurship: Implications for venture creation in the fourth industrial revolution". *Entrepreneurship Theory and Practice*. 45(5): 1028–1053.

Chui, M. and S. Malhotra (2018). *AI Adoption Advances, but Foundational Barriers Remain*. McKinsey and Company. URL: https://www.mckinsey.com/featured-insights/artificial-intelligence/ai-adoption-advances-but-foundational-barriers-remain.

Coad, A., K. Nielsen, and B. Timmermans (2017). "My first employee: An empirical investigation". *Small Business Economics*. 48: 25–45.

Cochran, J. J. (2018). *Informs Analytics Body of Knowledge*. John Wiley & Sons.

Cockburn, I., R. Henderson, and S. Stern (2019). "The impact of artificial intelligence on innovation: An exploratory analysis". In: *The Economics of Artificial Intelligence: An Agenda*. Ed. by A. Agrawal, J. Gans, and A. Goldfarb. Chicago: University of Chicago Press. 115–148. DOI: 10.7208/9780226613475-006.

Colombelli, A., E. Paolucci, E. Raguseo, and G. Elia (2024). "The creation of digital innovative start-ups: The role of digital knowledge spillovers and digital skill endowment". *Small Business Economics*. 62: 917–937.

Comunale, M. and A. Manera (2024). The economic impacts and the regulation of AI: A review of the academic literature and policy actions. *IMF Working Paper No. 2024/65*.

Congregado, E. (2007). *Measuring Entrepreneurship: Building A Statistical System*. Vol. 16. Springer Science & Business Media.

Congregado, E., A. A. Golpe, and S. C. Parker (2012a). "The dynamics of entrepreneurship: Hysteresis, business cycles and government policy". *Empirical Economics*. 43: 1239–1261.

Congregado, E., A. Golpe, and A. Van Stel (2012b). "The 'recession-push' hypothesis reconsidered". *International Entrepreneurship and Management Journal*. 8: 325–342.

Congregado, E., F. M. Fossen, N. Rubino, and D. Troncoso (2024). Long-term effects of shocks on new opportunity and necessity entrepreneurship. *IZA Discussion Paper 16930*. URL: https://docs.iza.org/dp16930.pdf.

Coombs, C., D. Hislop, S. K. Taneva, and S. Barnard (2020). "The strategic impacts of intelligent automation for knowledge and service work: An interdisciplinary review". *Journal of Strategic Information Systems*. 29(4): 101600.

Cuellar, M. F., B. Larsen, Y. S. Lee, and M. Webb (2024). "Does information about AI regulation change manager evaluation of ethical concerns and intent to adopt AI?" *The Journal of Law, Economics, and Organization*. 2024(40): 34–75.

Czarnitzki, D., G. P. Fernández, and C. Rammer (2023). "Artificial intelligence and firm-level productivity". *Journal of Economic Behavior & Organization*. 211: 188–205.

Dahlke, J., M. Beck, J. Kinne, D. Lenz, R. Dehghan, M. Wörter, and B. Ebersberger (2024). "Epidemic effects in the diffusion of emerging digital technologies: Evidence from artificial intelligence adoption". *Research Policy*. 53(2): 104917.

Daugherty, P. R., H. J. Wilson, and P. Michelman (2019). "Revisiting the jobs artificial intelligence will create". *MIT Sloan Management Review*. 60(4): 0_1–0_8.

Davidsson, P., J. Recker, and F. Von Briel (2020). "External enablement of new venture creation: A framework". *Academy of Management Perspectives*. 34(3): 311–332.

Davidsson, P. and M. Sufyan (2023). "What does AI think of AI as an external enabler (EE) of entrepreneurship? An assessment through and of the EE framework". *Journal of Business Venturing Insights*. 20: e00413.

Dellermann, D., N. Lipusch, P. Ebel, and J. M. Leimeister (2019). "Design principles for a hybrid intelligence decision support system for business model validation". *Electronic Markets*. 29(3): 423–441.

Dencker, J. C., S. Bacq, M. Gruber, and M. Haas (2021). "Reconceptualizing necessity entrepreneurship: A contextualized framework of entrepreneurial processes under the condition of basic needs". *Academy of Management Review*. 46(1): 60–79.

Dengler, K. and B. Matthes (2018). "The impacts of digital transformation on the labour market: Substitution potentials of occupations in Germany". *Technological Forecasting and Social Change*. 137: 304–316.

Desai, S. (2019). "Artificial intelligence and entrepreneurship: Some thoughts for entrepreneurship researchers". In: *A Research Agenda for Entrepreneurship and Innovation*. Ed. by D. B. Audretsch, E. E. Lehmann, and A. Link. Edward Elgar Publishing. 197–207.

Dinlersoz, E., C. Dogan, and N. Zolas (2024). Starting up AI. *CES Discussion Papers No. 24-09*. Census Bureau, Center for Economic Studies.

Du, W., S. L. Pan, N. Zhou, and T. Ouyang (2018). "From a marketplace of electronics to a digital entrepreneurial ecosystem (DEE): The emergence of a meta-organization in Zhongguancun, China". *Information Systems Journal*. 28(6): 1158–1175.

Duan, Y., T. S. Hsieh, R. R. Wang, and Z. Wang (2020). "Entrepreneurs' facial trustworthiness, gender, and crowdfunding success". *Journal of Corporate Finance*. 64: 101693.

Ehret, M. and J. Wirtz (2017). "Unlocking value from machines: Business models and the industrial internet of things". *Journal of Marketing Management*. 33(1–2): 111–130.

Elia, G., A. Margherita, and G. Passiante (2020). "Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process". *Technological Forecasting and Social Change*. 150: 119791.

Eloundou, T., S. Manning, P. Mishkin, and D. Rock (2023). "GPTs are GPTs: An early look at the labor market impact potential of large language models". *arXiv preprint arXiv:2303.10130*.

Emmert-Streib, F. and M. Dehmer (2022). "Taxonomy of machine learning paradigms: A data-centric perspective". *Wiley Interdisciplinary Reviews. Data Mining and Knowledge Discovery*. 12(5): e1470–n/a. DOI: 10.1002/widm.1470.

European Digital SME Alliance (2021). *DIGITAL SME Position Paper on the EU AI Act*. URL: https://www.digitalsme.eu/digital/uploads/DIGITAL-SME-Position-Paper-AI-Act-FINAL-DRAFT-1.pdf.

Fairlie, R. W. (2013). "Entrepreneurship, economic conditions, and the Great Recession". *Journal of Economics & Management Strategy*. 22(2): 207–231.

Fairlie, R. W. and J. Miranda (2017). "Taking the leap: The determinants of entrepreneurs hiring their first employee". *Journal of Economics & Management Strategy*. 26(1): 3–34.

Fairlie, R. W. and F. M. Fossen (2020). "Defining opportunity versus necessity entrepreneurship: Two components of business creation". In: *Change at Home, in the Labor Market and on the Job*. Ed. by S. W. Polachek and K. Tatsiramos. Research in Labor Economics. 48.

Fedorets, A., S. Kirchner, J. Adriaans, and O. Giering (2022). "Data on digital transformation in the German Socio-economic Panel". *Jahrbücher für Nationalökonomie und Statistik*. 242(5–6): 691–705.

Felten, E. W., M. Raj, and R. Seamans (2018). "A method to link advances in artificial intelligence to occupational abilities". *AEA Papers and Proceedings*. 108: 54–57.

Felten, E., M. Raj, and R. Seamans (2021). "Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses". *Strategic Management Journal*. 42(12): 2195–2217.

Felten, E., M. Raj, and R. Seamans (2023). "How will language modelers like ChatGPT affect occupations and industries?" *arXiv preprint arXiv:2303.01157*.

Ferrati, F. and M. Muffatto (2021). "Entrepreneurial finance: Emerging approaches using machine flearning and big data". *Foundations and Trends® in Entrepreneurship*. 17(3): 232–329.

Ferreira, J. J. M., E. Grigoroudis, E. G. Carayannis, and L. Dooley (2023). "The role of entrepreneurial ecosystems in technological and social challenges". *R&D Management*. 53(4): 563–583.

Fish, K. and P. Ruby (2009). "An artificial intelligence foreign market screening method for small businesses". *International Journal of Entrepreneurship*. 13: 65.

Foss, N. J. and P. G. Klein (2012). *Organizing Entrepreneurial Judgment: A New Approach to the Firm*. Cambridge University Press.

Fossen, F. M. and T. J. M. Buettner (2013). "The returns to education for opportunity entrepreneurs, necessity entrepreneurs, and paid employees". *Economics of Education Review*. 37: 66–84.

Fossen, F. M. and T. Martin (2018). "Entrepreneurial dynamics over space and time". *Regional Science and Urban Economics*. 70: 204–214.

Fossen, F. M. and A. Sorgner (2019). "Mapping the future of occupations: Transformative and destructive effects of new digital technologies on jobs". *Foresight and STI Governance*. 13((2 eng)): 10–18.

Fossen, F. M. (2021). "Self-employment over the business cycle in the USA: A decomposition". *Small Business Economics*. 57(4): 1837–1855.

Fossen, F. M. and A. Sorgner (2021). "Digitalization of work and entry into entrepreneurship". *Journal of Business Research*. 125: 548–563.

Fossen, F. M. and A. Sorgner (2022). "New digital technologies and heterogeneous wage and employment dynamics in the United States: Evidence from individual-level data". *Technological Forecasting and Social Change*. 175: 121381.

Fossen, F. M., T. McLemore, and A. Sorgner (2022a). "The regional impacts of digitalization of work on entrepreneurship in the United States". In: *Handbook of Digital Entrepreneurship*. Ed. by M. Keyhani, T. Kollmann, A. Ashjari, A. Sorgner, and C. E. Hull. Edward Elgar Publishing.

Fossen, F. M., D. Samaan, and A. Sorgner (2022b). "How are patented AI, software and robot technologies related to wage changes in the United States?" *Frontiers in Artificial Intelligence*. 5: 869282.

Fossen, F. M. and L. Neyse (2024). "Entrepreneurship, management, and cognitive reflection: A preregistered replication study with extensions". *Entrepreneurship Theory and Practice*. 48(4): 1082–1109.

Fountaine, T., B. McCarthy, and T. Saleh (2019). "Building the AI-powered organization". *Harvard Business Review*: 63–73.

Franzoni, V., A. Milani, and D. Nardi (2019). "Emotional machines: The next revolution". *Web Intelligence*. 17(1): 1–7. IOS Press.

Frey, C. B. and M. A. Osborne (2017). "The future of employment: How susceptible are jobs to computerisation?" *Technological Forecasting and Social Change*. 114: 254–280.

Fritsch, M., A. Sorgner, M. Wyrwich, and E. Zazdravnykh (2019). "Historical shocks and persistence of economic activity: Evidence on self-employment from a unique natural experiment". *Regional Studies*. 53(6): 790–802.

Fritsch, M. and M. Wyrwich (2023). "Entrepreneurship in the long-run: Empirical evidence and historical mechanisms". *Foundations and Trends® in Entrepreneurship*. 19(1): 1–125.

Furman, J. and R. Seamans (2019). "AI and the economy". *Innovation Policy and the Economy*. 19: 161–191.

Garbuio, M. and N. Lin (2019). "AI as a growth engine for health care startups: Emerging business models". *California Management Review*. 61(2): 59–83.

Gaspar, R., C. Pedro, P. Panagiotopoulos, and B. Seibt (2016). "Beyond positive or negative: Qualitative sentiment analysis of social media reactions to unexpected stressful events". *Computers in Human Behavior*. 56: 179–191.

Georgellis, Y. and H. J. Wall (2005). "Gender differences in self-employment". *International Review of Applied Economics*. 19(3): 321–342.

Georgieff, A. and R. Hyee (2022). "Artificial intelligence and employment: New cross-country evidence". *Frontiers in Artificial Intelligence*. 5: 832736.

Giering, O., A. Fedorets, J. Adriaans, and S. Kirchner (2021). "Artificial intelligence in Germany: Employees often unaware they are working with AI-based systems". *DIW Weekly Report*. 11(48): 369–375.

Gerling, C., P. Meier, and C. Koehler (2022). "AI meets digital: A critical review on artificial intelligence in digital entrepreneurship". In: *ECIS, 2022 Research Papers 21, European Conference on Information Systems*. URL: https://aisel.aisnet.org/ecis2022_rp/21.

Giuggioli, G. and M. M. Pellegrini (2023). "Artificial intelligence as an enabler for entrepreneurs: A systematic literature review and an agenda for future research". *International Journal of Entrepreneurial Behavior & Research*. 29(4): 816–837.

Giuntella, O., J. König, and L. Stella (2023). Artificial intelligence and workers' well-being. *IZA Discussion Paper 16485,* Institute of Labor Economics.

Glikson, E. and A. W. Woolley (2020). "Human trust in artificial intelligence: Review of empirical research". *Academy of Management Annals.* 14(2): 627–660.

Glupker, J., V. Nair, B. Richman, K. Riener, and A. Sharma (2019). "Predicting investor success using graph theory and machine learning". *Journal of Investment Management.* 17(1): 92–103.

Goebel, J., M. M. Grabka, S. Liebig, M. Kroh, D. Richter, C. Schröder, and J. Schupp (2019). "The German Socio-economic Panel (SOEP)". *Jahrbücher für Nationalökonomie und Statistik.* 239(2): 345–360.

Goel, R. K., J. W. Saunoris, and X. Zhang (2015). "Innovation and underground entrepreneurship". *Journal of Technology Transfer.* 40(5): 800–820.

Goel, R. K. and M. A. Nelson (2024a). "Do college anti-plagiarism/cheating policies have teeth in the age of AI? Exploratory evidence from the Internet". *Managerial and Decision Economics.* 45(4): 1739–2665. DOI: 10.1002/mde.4139.

Goel, R. K. and M. A. Nelson (2024b). "Awareness of artificial intelligence: Diffusion of AI versus ChatGPT information with implications for entrepreneurship". *The Journal of Technology Transfer.* DOI: 10.1007/s10961-024-10089-3.

Gofman, M. and Z. Jin (2024). "Artificial intelligence, education, and entrepreneurship". *The Journal of Finance.* 79(1): 631–667.

Goldfarb, A. and C. Tucker (2019). "Digital economics". *Journal of Economic Literature.* 57(1): 3–43.

Goldfarb, A., B. Taska, and F. Teodoridis (2023). "Could machine learning be a general purpose technology? A comparison of emerging technologies using data from online job postings". *Research Policy.* 52(1): 104653.

Graef, I. and J. Prüfer (2021). "Governance of data sharing: A law & economics proposal". *Research Policy.* 50(9): 104330.

Gries, T. and W. Naudé (2022). "Modelling artificial intelligence in economics". *Journal for Labour Market Research.* 56(1): 12.

Gupta, B. B., A. Gaurav, P. K. Panigrahi, and V. Arya (2023). "Analysis of artificial intelligence-based technologies and approaches on sustainable entrepreneurship". *Technological Forecasting and Social Change*. 186: 122152.

Haefner, N., J. Wincent, V. Parida, and O. Gassmann (2021). "Artificial intelligence and innovation management: A review, framework, and research agenda". *Technological Forecasting and Social Change*. 162: 120392.

Hannigan, T. R., A. R. Briggs, R. Valadao, M. D. L. Seidel, and P. D. Jennings (2022). "A new tool for policymakers: Mapping cultural possibilities in an emerging AI entrepreneurial ecosystem". *Research Policy*. 51: 104315.

Harris, E., J. Harris, and M. Beall (2024). "Defense in depth: An action plan to increase the safety and security of advanced AI. Gladstone AI". URL: https://www.gladstone.ai/action-plan.

Heath, R. (2024). "Exclusive: States are introducing 50 AI-related bills per week". *Axios*. URL: https://www.axios.com/2024/02/14/ai-bills-state-legislatures-deepfakes-bias-discrimination.

Henley, A. (2021). "The rise of self-employment in the UK: Entrepreneurial transmission or declining job quality?" *Cambridge Journal of Economics*. 45(3): 457–486.

High-Level Expert Group on Artificial Intelligence (2019). *Ethics guidelines for trustworthy AI*. European Commission. URL: https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai.

Himel, S. and R. Seamans (2017). "Artificial intelligence, incentives to innovate, and competition policy". *Antitrust Chronicle*. 1(3): 1–10.

Hoffman, A. (2004). "Reconsidering the role of the practical theorist: On (re)connecting theory to practice in organization theory". *Strategic Organization*. 2(2): 213–222.

Hoffmann, J., S. Borgeaud, A. Mensch, E. Buchatskaya, T. Cai, E. Rutherford, ..., and L. Sifre (2022). "Training compute-optimal large language models". *arXiv preprint arXiv:2203.15556*.

Hoffreumon, C., C. Forman, and N. Van Zeebroeck (2024). "Make or buy your artificial intelligence? Complementarities in technology sourcing". *Journal of Economics & Management Strategy*. 33(2): 452–479.

Huang, M. H. and R. Rust (2018). "Artificial intelligence in service". *Journal of Service Research*. 21(2): 155–172.

Huang, M. H., R. Rust, and V. Maksimovic (2019). "The feeling economy: Managing in the next generation of AI". *California Management Review*. 61(4): 43–65.

Hurst, E. and B. W. Pugsley (2011). "What do small businesses do?" *Brookings Papers on Economic Activity*. 2011(2): 73–118.

International Organization for Standardization/International Electrotechnical Commission (2022). "Information Technology—Artificial intelligence—Artificial intelligence concepts and terminology (ISO/IEC Standard No. 22989)". URL: https://www.iso.org/standard/74296.html.

Jacobides, M. G., S. Brusoni, and F. Candelon (2021). "The evolutionary dynamics of the artificial intelligence ecosystem". *Strategy Science*. 6(4): 412–435.

Jacquemin, A. and F. Janssen (2015). "Studying regulation as a source of opportunity rather than as a constraint for entrepreneurs: Conceptual map and research propositions". *Environment and Planning C: Government and Policy*. 33: 846–862.

Jia, J., G. Z. Jin, and L. Wagman (2018). *The short-run effects of GDPR on technology venture investment. NBER Working Paper 25248*.

Jöhnk, J., M. Weißert, and K. Wyrtki (2021). "Ready or not, AI comes—An interview study of organizational AI readiness factors". *Business and Information Systems Engineering*. 63(1): 5–20.

Kang, C. and D. E. Sanger (2023). *Biden issues executive order to create A.I. safeguards*. The New York Times. URL: https://www.nytimes.com/2023/10/30/us/politics/biden-ai-regulation.html.

Kazakova, S. S., A. A. Dunne, D. D. Bijwaard, J. Gossé, C. Hoffreumon, and N. van Zeebroeck (2020). *European Enterprise Survey on the Use of Technologies Based on Artificial Intelligence*. Universite Libre de Bruxelles. URL: https://EconPapers.repec.org/RePEc:ulb:ulbeco:2013/341443.

Keding, C. (2021). "Understanding the interplay of artificial intelligence and strategic management: Four decades of research in review". *Management Review Quarterly*. 71(1): 91–134.

Kerr, W. R. and F. Robert-Nicoud (2020). "Tech clusters". *Journal of Economic Perspectives*. 34(3): 50–76.

Keyhani, M., A. Ashjari, A. Sorgner, T. Kollmann, C. E. Hull, and Z. Jamshidi (2022). "An introduction to digital entrepreneurship: Concepts and themes". In: *Handbook of Digital Entrepreneurship*. Ed. by M. Keyhani, T. Kollmann, A. Ashjari, A. Sorgner, and C. E. Hull. Edward Elgar Publishing.

Kier, A. S. and J. S. McMullen (2018). "Entrepreneurial imaginativeness in new venture ideation". *Academy of Management Journal*. 61(6): 2265–2295.

Klapper, L. F. and I. Love (2011). "Entrepreneurship and development: The role of information asymmetries". *The World Bank Economic Review*. 25(3): 448–455.

Klein, E. ((2023). "A.I. could solve some of humanity's hardest problems. It already has. (No. 4) [Audio podcast episode]". In: *The Ezra Klein Show*. The New York Times.

Knight, F. H. (1921). *Risk, Uncertainty and Profit*. Vol. 31. Houghton Mifflin.

Kollmann, T., L. Kleine-Stegemann, C. de Cruppe, and C. Strauss (2022). "Eras of digital entrepreneurship: Connecting the past, present, and future". In: *Handbook of Digital Entrepreneurship*. Ed. by M. Keyhani, T. Kollmann, A. Ashjari, A. Sorgner, and C. E. Hull. Edward Elgar Publishing.

Lamine, W., A. Fayolle, S. Jack, and D. Audretsch (2023). "Impact of digital technologies on entrepreneurship: Taking stock and looking forward". *Technovation*. 126: 102823.

Lane, M., M. Williams, and S. Broecke (2023). "The impact of AI on the workplace: Main findings from the OECD AI surveys of employers and workers". OECD Social, Employment and Migration Working Papers No. 288.

Leendertse, J., M. Schrijvers, and E. Stam (2022). "Measure twice, cut once: Entrepreneurial ecosystem metrics". *Research Policy*. 51(9): 104336.

Lévesque, M., M. Obschonka, and S. Nambisan (2022). "Pursuing impactful entrepreneurship research using artificial intelligence". *Entrepreneurship Theory and Practice*. 46(4): 803–832.

Levine, R. and Y. Rubinstein (2017). "Smart and illicit: Who becomes an entrepreneur and do they earn more?" *Quarterly Journal of Economics*. 132(2): 963–1018.

Lupp, D. (2023). "Effectuation, causation, and machine learning in co-creating entrepreneurial opportunities". *Journal of Business Venturing Insights*. 19: e00355.

Madridakis, S. (2017). "The forthcoming artificial intelligence (AI) revolution: Its impact on society and firms". *Futures*. 90: 46–60.

Malecki, E. J. (2018). "Entrepreneurship and entrepreneurial ecosystems". *Geography Compass*. 12(3): e12359.

Mamedov, O., Y. Tumanyan, O. Ishchenko-Padukova, and I. Movchan (2018). "Sustainable economic development and post-economy of AI". *Entrepreneurship and Sustainability Issues*. 6(2): 1028–1040.

Mariani, M. M., I. Machado, and S. Nambisan (2023). "Types of innovation and artificial intelligence: A systematic quantitative literature review and research agenda". *Journal of Business Research*. 155: 113364.

Maslej, N., L. Fattorini, R. Perrault, V. Parli, A. Reuel, E. Brynjolfsson, J. Etchemendy, K. Ligett, T. Lyons, J. Manyika, J. C. Niebles, Y. Shoham, R. Wald, and J. Clark (2024). *The AI Index 2024 Annual Report*. Stanford, CA: AI Index Steering Committee, Institute for Human-Centered AI, Stanford University.

McElheran, K., J. F. Li, E. Brynjolfsson, Z. Kroff, E. Dinlersoz, L. Foster, and N. Zolas (2024). "AI adoption in America: Who, what, and where". *Journal of Economics & Management Strategy*. 33: 375–415.

McKenzie, D. and D. Sansone (2019). "Predicting entrepreneurial success is hard: Evidence from a business plan competition in Nigeria". *Journal of Development Economics*. 141: 102369.

McMullen, J. S. and D. A. Shepherd (2006). "Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur". *Academy of Management Review*. 31(1): 132–152.

Méndez-Suárez, M., V. Simón-Moya, and J. Muñoz-de Prat (2023). "Do current regulations prevent unethical AI practices?" *Journal of Competitiveness*. 15(3): 207–222.

Mickiewicz, T. and A. Rebmann (2020). "Entrepreneurship as trust". *Foundations and Trends® in Entrepreneurship*. 16(3): 244–309.

Montes, G. A. and B. Goertzel (2019). "Distributed, decentralized, and democratized artificial intelligence". *Technological Forecasting and Social Change*. 141: 354–358.

Mueller, B. (2021). "How much will the Artificial Intelligence Act cost Europe? Center for Data Innovation". URL: https://www2.datainnovation.org/2021-aia-costs.pdf.

Nambisan, S. (2017). "Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship". *Entrepreneurship Theory and Practice*. 41(6): 1029–1055.

Naudé, W. (2023). Destructive digital entrepreneurship. *IZA Discussion Paper 16483,* Institute for the Study of Labor.

Nikolova, M. (2019). "Switching to self-employment can be good for your health". *Journal of Business Venturing*. 34(4): 664–691.

Nikolova, M., B. Nikolaev, and C. Boudreaux (2023). "Being your own boss and bossing others: The moderating effect of managing others on work meaning and autonomy for the self-employed and employees". *Small Business Economics*. 60(2): 463–483.

Nolan, M. (2023). "Llama and ChatGPT are not open-source—Few ostensibly open-source LLMs live up to the openness claim". *IEEE Spectrum*. URL: https://spectrum.ieee.org/open-source-llm-not-open.

Norval, C., H. Janssen, J. Cobbe, and J. Singh (2021). "Data protection and tech startups: The need for attention, support, and scrutiny". *Policy & Internet*. 13(2): 278–299.

Noy, S. and W. Zhang (2023). "Experimental evidence on the productivity effects of generative artificial intelligence". *Science*. 381(6654): 187–192.

Obschonka, M. and D. B. Audretsch (2020). "Artificial intelligence and big data in entrepreneurship: A new era has begun". *Small Business Economics*. 55: 529–539.

Obschonka, M. and C. Fisch (2022). "Artificial intelligence and entrepreneurship research". Oxford Research Encyclopedia of Business and Management, Oxford University Press.

O'Donnell, P., M. Leger, C. O'Gorman, and E. Clinton (2024). "Necessity entrepreneurship". *Academy of Management Annals*. 18(1): 44–81.

OECD (2019). *Recommendation of the council on artificial intelligence*. OECD Legal Instruments.

OECD (2024). *Explanatory memorandum on the updated OECD definition of an AI system. OECD Artificial Intelligence Papers, No. 8*. URL: https://www.oecd.org/science/explanatory-memorandum-on-the-updated-oecd-definition-of-an-ai-system-623da898-en.htm.

Otis, N., R. Clarke, S. Delecourt, B. Holtz, and R. Koning (2024). "The uneven impact of generative AI on entrepreneurial performance". DOI: 10.2139/ssrn.4671369.

Özgul, P., M. C. Fregin, M. Stops, S. Janssen, and M. Levels (2024). "High-skilled human workers in non-routine jobs are susceptible to AI automation but wage benefits differ between occupations". *arXiv preprint arXiv:2404.06472*.

Packard, M. D., B. B. Clark, and P. G. Klein (2017). "Uncertainty types and transitions in the entrepreneurial process". *Organization Science*. 28(5): 840–856.

Paolillo, A., F. Colella, N. Nosengo, F. Schiano, W. Stewart, D. Zambrano, I. Chappuis, R. Lalive, and D. Floreano (2022). "How to compete with robots by assessing job automation risks and resilient alternatives". *Science Robotics*. 7: eabg5561.

Parent-Rocheleau, X. and S. K. Parker (2022). "Algorithms as work designers: How algorithmic management influences the design of jobs". *Human Resource Management Review*. 32(3): 100838.

Raab, M., S. Schlauderer, S. Overhage, and T. Friedrich (2020). "More than a feeling: Investigating the contagious effect of facial emotional expressions on investment decisions in reward-based crowdfunding". *Decision Support Systems*. 135: 113326.

Ramesh, G. S., T. V. R. Kanth, and D. Vasumaathi (2018). "Analysis of customer data using hybridized machine learning technique along with data exploration methods". *International Journal of Engineering and Technology*. 7(4): 4388–4392.

Rammer, C., G. P. Fernández, and D. Czarnitzki (2022). "Artificial intelligence and industrial innovation: Evidence from German firm-level data". *Research Policy*. 51(7): 104555.

Ransbotham, S., P. Gerbert, M. Reeves, D. Kiron, and M. Spira (2018). "Artificial intelligence in business gets real". *MIT Sloan Management Review*. URL: https://sloanreview.mit.edu/projects/artificial-intelligence-in-business-gets-real/.

Ransbotham, S., S. Khodabandeh, D. Kiron, F. Candelon, M. Chu, and B. LaFountain (2020). "Expanding AI's impact with organizational learning". *MIT Sloan Management Review*.

Reimers, N. and I. Gurevych (2019). "Sentence-BERT: Sentence embeddings using Siamese BERT-networks". *arXiv preprint arXiv:1908.10084*.

Richter, D. and J. Schupp (2015). "The SOEP Innovation Sample (SOEP-IS)". *Journal of Contextual Economics–Schmollers Jahrbuch*. 135(3): 389–400.

Ritsilä, J. and H. Tervo (2002). "Effects of unemployment on new firm formation: Micro-level panel data evidence from Finland". *Small Business Economics*. 19: 31–40.

Robertson, K. (2024). "8 daily newspapers sue OpenAI and microsoft over A.I." *New York Times*. URL: https://www.nytimes.com/2024/04/30/business/media/newspapers-sued-microsoft-openai.html.

Saheb, T. and T. Saheb (2023). "Topical review of artificial intelligence national policies: A mixed method analysis". *Technology in Society*. 74: 102316.

Samoili, S., M. López Cobo, E. Gómez, G. De Prato, F. Martínez-Plumed, and B. Delipetrev (2021). *AI Watch. Defining Artificial Intelligence 2.0*. Luxembourg: EUR 30873 EN, Publications Office of the European Union. DOI: 10.2760/019901.

Scherpenzeel, A. (2011). "Data collection in a probability-based internet panel: How the LISS panel was built and how it can be used". *Bulletin of Sociological Methodology*. 109(1): 56–61.

Schiavone, F., M. C. Pietronudo, A. Sabetta, and F. Bernhard (2022). "Designing AI implications in the venture creation process". *International Journal of Entrepreneurial Behavior & Research*. 29(4): 838–859.

Schwab, A. and Z. Zhang (2019). "A new methodological frontier in entrepreneurship research: Big data studies". *Entrepreneurship Theory and Practice*. 43(5): 843–854.

Serrano, C. (2024). "AI can level global playing field. Knowledge@HEC". URL: https://www.hec.edu/en/ai-can-level-global-playing-field.

Shane, S. (2000). "Prior knowledge and the discovery of entrepreneurial opportunities". *Organization Science*. 11(4): 448–469.

Shepherd, D. A. and A. Majchrzak (2022). "Machines augmenting entrepreneurs: Opportunities (and threats) at the Nexus of artificial intelligence and entrepreneurship". *Journal of Business Venturing*. 37(4): 106227.

Shepherd, D. A., K. Wennberg, R. Suddaby, and J. Wiklund (2019). "What are we explaining? A review and agenda on initiating, engaging, performing, and contextualizing entrepreneurship". *Journal of Management*. 45(1): 159–196.

Short, C. E. and J. C. Short (2023). "The artificially intelligent entrepreneur: ChatGPT, prompt engineering, and entrepreneurial rhetoric creation". *Journal of Business Venturing Insights*. 19: e00388.

Shrestha, Y. R., S. M. Ben-Menahem, and G. von Krogh (2019). "Organizational decision-making structures in the age of artificial intelligence". *California Management Review*. 61(4): 66–83.

Song, A. K. (2019). "The digital entrepreneurial ecosystem—A critique and reconfiguration". *Small Business Economics*. 53: 569–590.

Sorgner, A. and M. Wyrwich (2022). "Calling Baumol: What telephones can tell us about the allocation of entrepreneurial talent in the face of radical institutional changes". *Journal of Business Venturing*. 37(5): 106246.

Sorgner, A. (2023). "COVID-19 and entrepreneurship". In: *Handbook of Labor, Human Resources and Population Economics*. Ed. by K. F. Zimmermann. DOI: 10.1007/978-3-319-57365-6_321-1.

Spigel, B. (2017). "The relational organization of entrepreneurial ecosystems". *Entrepreneurship Theory and Practice*. 41(1): 49–72.

Stam, E. (2015). "Entrepreneurial ecosystems and regional policy: A sympathetic critique". *European Planning Studies*. 23(9): 1759–1769.

Stam, E. and B. Spigel (2018). "Entrepreneurial ecosystems". In: *The SAGE Handbook of Small Business and Entrepreneurship*. 407–422.

Stix, C. (2020). "A survey of the European Union's artificial intelligence ecosystem". DOI: 10.48550/arXiv.2101.02039.

Storey, D. J. (1991). "The birth of new firms—Does unemployment matter? A review of the evidence". *Small Business Economics*. 3: 167–178.

Stucke, M. E. and A. P. Grunes (2016). *Introduction: Big Data and Competition Policy*. Big Data and Competition Policy, Oxford University Press.

Subramaniam, M., B. Iyer, and V. Venkatraman (2019). "Competing in digital ecosystems". *Business Horizons*. 62(1): 83–94.

Sussan, F. and Z. J. Acs (2017). "The digital entrepreneurial ecosystem". *Small Business Economics*. 49: 55–73.

Tangredi, S. J. and G. Galdorisi (2021). *AI at War: How Big Data, Artificial Intelligence, and Machine Learning are Changing Naval Warfare*. Naval Institute Press.

Thurik, A. R., M. A. Carree, A. Van Stel, and D. B. Audretsch (2008). "Does self-employment reduce unemployment?" *Journal of Business Venturing*. 23(6): 673–686.

Timoteo, M., B. Verri, and Y. Wang (2021). "Ethics guidelines for artificial intelligence: Comparing the European and Chinese approaches". *China and WTO Review*. 2: 305–330.

Tomy, S. and E. Pardede (2018). "From uncertainties to successful start ups: A data analytic approach to predict success in technological entrepreneurship". *Sustainability*. 10(3): 602.

Torrisi, S., A. Gambardella, P. Giuri, D. Harhoff, K. Hoisl, and M. Mariani (2016). "Used, blocking and sleeping patents: Empirical evidence from a large-scale inventor survey". *Research Policy*. 45(7): 1374–1385.

Torres, P. and P. Godinho (2022). "Levels of necessity of entrepreneurial ecosystems elements". *Small Business Economics*. 59: 29–45.

Townsend, D. M. and R. A. Hunt (2019). "Entrepreneurial action, creativity, & judgment in the age of artificial intelligence". *Journal of Business Venturing Insights*. 11: e00126.

Townsend, D. M., R. A. Hunt, J. Rady, P. Manocha, and J. H. Jin (2023). "Are the futures computable? Knightian uncertainty and artificial intelligence". *Academy of Management Review*. DOI: 10.5465/amr.2022.0237.

University of Essex (2023). *Understanding Society: Innovation Panel, Waves 1-15, 2008–2022. [data collection]*. 12th ed. UK Data Service, Institute for Social and Economic Research. SN: 6849. DOI: 10.5255/UKDA-SN-6849-15.

Van der Zwan, P., R. Thurik, I. Verheul, and J. Hessels (2016). "Factors influencing the entrepreneurial engagement of opportunity and necessity entrepreneurs". *Eurasian Business Review*. 6: 273–295.

Van Gelderen, M., J. Wiklund, and J. S. McMullen (2021). "Entrepreneurship in the future: A Delphi study of ETP and JBV editorial board members". *Entrepreneurship Theory and Practice*. 45(5): 1239–1275.

Venancio, A., W. Picoto, and I. Pinto (2023). "Time-to-unicorn and digital entrepreneurial ecosystems". *Technological Forecasting & Social Change*. 190: 122425.

Wang, W., W. Chen, K. Zhu, and H. Wang (2020a). "Emphasizing the entrepreneur or the idea? The impact of text content emphasis on investment decisions in crowdfunding". *Decision Support Systems*. 136: 113341.

Wang, W., H. Zheng, and Y. J. Wu (2020b). "Prediction of fundraising outcomes for crowdfunding projects based on deep learning: A multimodel comparative study". *Soft Computing*. 24(11): 8323–8341.

Webb, M. (2020). The impact of artificial intelligence on the labor market. *Working Paper*. URL: https://www.michaelwebb.co/webb_ai.pdf.

Weber, M., M. Beutter, J. Weking, M. Böhm, and H. Krcmar (2022). "AI startup business models: Key characteristics and directions for entrepreneurship research". *Business & Information Systems Engineering*. 64(1): 91–109.

Wilkinson, G. (2018). "General data protection regulation: No silver bullet for small and medium-sized enterprises". *Journal of Payments Strategy & Systems*. 12(2): 139–149.

Wilson, H. J., P. Daugherty, and N. Bianzino (2017). "The jobs that artificial intelligence will create". *MIT Sloan Management Review*. 58(4): 14.

Winkler, C., B. Hammoda, E. Noyes, and M. Van Gelderen (2023). "Entrepreneurship education at the dawn of generative artificial intelligence". *Entrepreneurship Education and Pedagogy*. 6(4): 579–589.

Wurth, B., E. Stam, and B. Spigel (2022). "Toward an entrepreneurial ecosystem research program". *Entrepreneurship Theory and Practice*. 46(3): 729–778.

Wurth, B., E. Stam, and B. Spigel (2023). "Entrepreneurial ecosystem mechanisms". *Foundations and Trends® in Entrepreneurship*. 19(3): 224–339.

Yao, S., D. Yu, J. Zhao, I. Shafran, T. Griffiths, Y. Cao, and K. Narasimhan (2024). "Tree of thoughts: Deliberate problem solving with large language models". *Advances in Neural Information Processing Systems*. 36.

Yuan, H., R. Y. K. Lau, and W. Xu (2016). "The determinants of crowdfunding success: A semantic text analytics approach". *Decision Support Systems*. 91: 67–76.

Zellweger, T. and T. Zenger (2023). "Entrepreneurs as scientists: A pragmatist approach to producing value out of uncertainty". *Academy of Management Review*. 48(3): 379–408.