Doctoral School of Economics, Business and Informatics

Doctoral dissertation summary of

The impact of artificial intelligence on the economy and business with special attention to the labor market

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1. Research background and justification of the topic

The dissertation is situated within the rapidly expanding scholarly and societal debate on the effects of artificial intelligence (AI) on the economy, business, and especially the labor market.

Its research background emerges from the recognition that AI has moved beyond the realm of speculative science fiction and has become an increasingly widespread technological force shaping everyday life, organizational processes, and economic development. AI is no longer merely a niche technical subject discussed within computer science; rather, it is now a multidisciplinary concern that appears in scientific journals, policy debates, media discourse, consultancy reports, and public conversations alike. This broadening relevance is one of the central reasons why the topic of AI's impact on the economy, society with special attention to the labor market is both timely and necessary.

AI adoption has accelerated dramatically in recent years, especially with the rise of generative AI such as ChatGPT. Firms across sectors increasingly use AI for compliance, customer

service, prediction, diagnostics, image recognition, and automation. At the same time, public familiarity with AI tools has expanded significantly, and these technologies have become progressively more embedded in everyday life (Chui et al., 2021; *IBM Global AI Adoption Index 2022*, 2022; McKendrick, 2021; Nestor et al., 2025; OECD, 2025; OECD et al., 2025; Singla et al., 2025).

This pace of adoption creates a serious adaptation challenge, because labor markets, education systems, and public institutions often change more slowly than technology. The central problem is therefore not merely whether AI will affect work, but whether individuals, firms, and governments are prepared for that transformation.

The theoretical background of the dissertation is rooted in earlier and recent studies on technological change and labor market transformation. The dissertation places AI within the longer historical trajectory of technological shocks that have altered employment structures, productivity, and human welfare over time.

Earlier waves of innovation—from mechanization and industrialization to digitalization, automation and now AI—have

already demonstrated that technology can both displace and create jobs, alter skills demand, and reshape societies (Allen, 2017; Bertinelli et al., 2022; Fossen & Sorgner, 2022; Frey & Osborne, 2024, 2013, 2017; Goldin, 2017; Kim et al., 2017; Mitchell & Brynjolfsson, 2017; Segal, 2018).

The dissertation therefore begins from a historically informed perspective: AI is not the first technology to influence work, but it may be the first to affect both manual and intellectual labor at scale. This distinction is central to the background justification, because previous innovations tended to automate primarily physical or routine tasks, whereas AI increasingly threatens tasks traditionally associated with highly educated knowledge workers as well.

The dissertation argues that work is not only an economic necessity but also a fundamental social institution tied to identity, well-being, family relations, health, and self-esteem (Crayne, 2020; Grimm-Thomas & Perry-Jenkins, 1994; Klitzman et al., 1990; Lewis et al., 2007).

If AI changes the nature, quantity, or stability of work, then its impact extends far beyond firms and labor markets into the fabric of social life itself. This is why the dissertation frames the topic

in both macro and micro terms: AI affects economies and industries, but also individuals, families, and communities. The possible erosion of job security, increased inequality, and changes in occupational identity make the subject socially urgent.

While prior research has examined either technological unemployment, job polarization, AI ethics, or public attitudes separately, fewer studies combine scientific discourse and public discourse into one integrated research program. The dissertation aims to fill this gap by studying both the academic literature on AI and labor market change and the public perceptions expressed in online forums. In doing so, it addresses two research questions: how scientific and online public discourses reflect AI-induced labor market transformation, and what risks AI poses to the labor market together with possible strategies to address them. This dual focus is important because policy and organizational responses require not only theoretical insight, but also an understanding of how people perceive and emotionally respond to technological disruption.

2. Research methodology

The dissertation employs a mixed-method research design that integrates qualitative and quantitative methodologies in order to investigate the impact of artificial intelligence on the labor market from both scientific and public-discourse perspectives.

The methodological architecture is two-phased: first, a systematic literature review is conducted to map and synthesize the academic debate on AI and labor market transformation; second, an empirical analysis of Reddit discussions is undertaken using natural language processing (NLP) methods to explore public perceptions of AI and the future of work. This methodological combination is one of the central strengths of the dissertation because it enables the author to connect theoretical debates with real-world discourse and sentiment.

The first methodological pillar is the systematic literature review. This phase follows the five-step model proposed by Webster and Watson (2002). These steps include: defining the research focus, clarifying the main concepts, collecting and reviewing relevant literature, analyzing and synthesizing the findings, and finalizing the conclusions. The research focus was

defined as the effects of artificial intelligence on the labor market, with particular attention to the driving and retarding forces of technological unemployment.

The literature collection phase drew on major academic and scholarly databases such as Web of Science, EBSCO, and Google Scholar. Several hundred relevant papers were identified and analysed. The literature review therefore rests on a broad empirical base within the literature, allowing the dissertation to synthesize fragmented findings into a coherent framework concerning AI's economic, organizational, and labor market effects.

The second methodological pillar is the quantitative analysis of online public discourse. Here, the dissertation uses the so called "micro-blog analysis," more specifically the analysis of Reddit forums. Reddit was chosen because it is a major platform for user-generated discussion, has a large English-speaking user base, and contains substantial discussions about AI, work, automation, and the future of employment.

The empirical dataset was collected from Reddit posts between January 2013 and January 2024. The co-authors searched for

forums related to “artificial intelligence” or “AI” in conjunction with work-related terms such as “job,” “labor,” and related synonyms. Following data cleaning—removing deleted posts, extremely short comments, non-English material, URLs, emojis, and other noise—the final dataset consisted of 114,377 top-level comments.

The dissertation applies three major NLP techniques to analyse this text corpus: sentiment analysis, emotion detection, and topic modeling. For sentiment analysis, the study used a pre-trained RoBERTa model, specifically the “cardiffnlp/twitter-roberta-base-sentiment” model, to classify comments into positive, negative, and neutral categories (Barbieri et al., 2021; Devlin et al., 2018; Liu et al., 2019) and in other more fine grained categories such as anger or anticipation. RoBERTa was chosen because it is a transformer-based language model that offers superior contextual understanding compared with many lexicon-based approaches. Its advantage lies in its ability to account for context, rather than simply assigning emotional values word by word.

For topic modeling, the dissertation applies BERTopic, a modern topic modeling framework based on transformer

embeddings, dimensionality reduction, and clustering (Grootendorst, 2022). The comments were first embedded using the sentence-transformer model "all-MiniLM-L12-v2," then reduced in dimensionality through UMAP, and subsequently clustered with HDBSCAN. This process produced 23 latent topics, which were then labeled using c-TF-IDF, KeyBERT, and quantized large language model techniques. These topics were further grouped manually into four meta-topics: general AI and the future of work, economy, politics and influencers, and job transformation. This combination of machine-assisted topic extraction and researcher-driven interpretation is methodologically important because it balances computational rigor with substantive contextual understanding.

Overall, the dissertation's methods are notable for their complementarity. The qualitative systematic review establishes the conceptual and historical foundations of the topic, while the quantitative Reddit analysis captures how AI and labor market change are discussed, felt, and interpreted in public discourse. Together, these methods support the dissertation's aim of linking scientific knowledge with social perception, thereby producing a

richer and more multidimensional understanding of AI-induced labor market transformation.

3. Scientific results of the dissertation

- The dissertation demonstrates that AI is best understood as a labor-market-transforming technology rather than a purely labor-destroying one.
  Across the reviewed scientific literature and the empirical Reddit analysis, the findings suggest that the dominant effect of AI is not immediate full automation of all work, but the transformation of tasks, workflows, and required skill profiles. The dissertation shows that the earlier binary opposition—AI as either irrelevant or fully job-destroying—has evolved toward a more nuanced augmentation-versus-automation paradigm (Frey & Osborne, 2024; Furendal & Jebari, 2023; Raisch & Krakowski, 2020).

- The dissertation confirms that AI affects both manual and intellectual labor, making it historically distinct from earlier waves of technological change.
  Previous technological revolutions mainly automated physical and routine work, while leaving many highly skilled

knowledge professions relatively protected. The dissertation finds that generative AI has changed this pattern by extending automation and augmentation into high-skill intellectual domains such as software development, law, translation, medicine, education, and content creation (AbuMusab, 2023; Felten et al., 2023). The Reddit based study shows that highly educated professions have become newly salient in public fears about automation.

- One key scientific result is the systematization of the driving and retarding forces of AI-induced technological unemployment. Through the systematic literature review, the dissertation identifies the main drivers of displacement—cost reduction, speed, error minimization, scalability, and market pressure—as well as the mitigating mechanisms that may reduce technological unemployment, such as job creation, productivity spillovers, human-AI cooperation, innovation, and demand expansion (Allen, 2017; Boncz & Szabó, 2022; Makridakis, 2017; Pianta & Vivarelli, 2000).

- The dissertation finds that public discourse on AI and work is predominantly negative, but this negativity is not static. The Reddit analysis shows that the overall sentiment of public

discussions about AI and labor market transformation is negative, especially in the earlier years of the dataset. Fear, anger, and disgust dominate many threads, particularly those concerned with job replacement, inequality, and societal decline. However, after the emergence of ChatGPT, the emotional landscape became more mixed, with surprise, anticipation and even optimism becoming more prominent (Fodor & Boncz, 2025). This demonstrates that public perception evolves in response to concrete technological developments.

- Another important result is the identification of two major "game changers" in the emotional and thematic evolution of public AI discourse: the COVID-19 pandemic and the release of ChatGPT.
  The dissertation shows that the COVID-19 pandemic altered technology-related emotions by intensifying both dependence on digital tools and concerns about surveillance and control. Later, the release of ChatGPT in 2022 triggered a sharp increase in the volume of comments and shifted discourse toward more experience-based discussion. This transition marks the movement from speculative anxiety toward direct

engagement with AI's everyday workplace effects, and an increase in positive sentiments.

- The dissertation contributes methodologically by showing that transformer-based NLP tools can be productively applied to socio-economic analysis. By combining RoBERTa-based sentiment analysis, transformer-based emotion detection, and BERTopic modeling, the dissertation demonstrates the analytical value of state-of-the-art NLP tools in labor market research. This is not only a methodological contribution but also a scientific result in itself, as it validates computational text analysis as a means to study perceptions of technological change in society.

- The dissertation concludes that adaptation strategies must be multi-level and proactive, and it should among others focus on AI safety, and ethical AI use (Boncz & Szabó, 2021). The findings indicate that successful adjustment to AI requires responses at the individual, organizational, and policy levels. These include education reform, lifelong learning, reskilling, workforce protection, human-centered AI design, trust-building, and clear legal-ethical frameworks. In particular, the dissertation argues that education systems must be reoriented

toward creativity, adaptability, social skills, and AI literacy, because these are the capabilities least likely to be displaced by machines.

- Finally, the dissertation's overarching scientific conclusion is that AI-induced labor market change is not only an economic issue but also a social, ethical, and political one. The transformation of work affects income distribution, identity, health, well-being, institutional trust, and societal cohesion. Therefore, the dissertation argues that AI and labor market research must be interdisciplinary and must combine economic analysis with social science, ethics, and public discourse analysis. This integrated perspective constitutes the dissertation's main intellectual contribution.

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