

# Essays on Technology and Society

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## Summary

This dissertation investigates how new technologies, particularly algorithms and online media, impact human decision-making and attitudes. The thesis is structured into five chapters, with Chapter 1 providing the roadmap of the dissertation and introducing the motivation, the research questions, the methodology, and the data used. Chapters 2, 3, and 4 investigate, through empirical research, the two topics of the thesis: the impacts of digital technologies on the job market and the political sphere of democratic countries.

Chapter 2 investigates whether the recommendations made by an algorithm are perceived differently from those made by a human (expert) and potentially lead to a different outcome of the hiring process. Through a preregistered field experiment with law firms, I test whether there is an observable difference in employers' evaluation of candidates recommended by algorithms in comparison to those recommended by human advisors. I further elicit preexisting attitudes and beliefs regarding certain characteristics of algorithms in a labor market context and a general preference for algorithmic vs human advice. This allows me to explore whether and how potential differences in these individual beliefs and preferences might alter how they respond to advice generated by these sources. I take advantage of the setup of a large job fair to collect employers' judgments on CV recommendations without intervening in any other behavior except for randomly labeling the CVs.

Results show no overall effect of the CV label. While characteristics such as work experience or speaking English do affect the rating of a candidate's qualification and the hiring interest, the source of recommendation does not. Findings also show no overall effect on job offers or CV retention. In the analysis of heterogeneity in the treatment effect along with preexisting attitudes and beliefs regarding certain characteristics of algorithms, I do not find an interaction of the treatment effect with the labor market-specific beliefs about algorithms. This potentially reflects that most participants do not believe one source of recommendations dominates the other in all three dimensions elicited. It is rather the general preference for algorithms that seems to matter for the qualification rating of a candidate. On the one hand, decision-makers with a general preference for algorithmic advice give significantly higher ratings if a candidate was recommended by an algorithm compared to when the candidate was recommended by a human resource expert. On the other hand, decision-makers with a general preference for human advice give significantly lower ratings to candidates recommended by algorithms compared to candidates recommended by humans.

Chapters 3 and 4 examine the second topic of the thesis: the impact of the internet and social media usage on the political sphere and, more specifically, on the process of political polarization. The Chapters search for a causal link between the internet and social media use and (i) the enhancement of feelings of hostility towards opposing candidates and (ii) greater deviation from centrist positions on political ideology and attitudes. Both studies use instrumental variables (IV) techniques to investigate the effect of the internet and social media use on political polarization.

In Chapter 3, I employ an IV approach that follows past studies using exogenous infrastructure variations to identify the internet's impact on political attitudes. I use exogenous variation in the fiber-optic backhauled infrastructure to identify the impact of the internet and social media usage on political polarization in Brazil. For the IV analysis, we use a dummy variable indicating the availability of fiber optic backhaul for each municipality in 2018.

In Chapter 4, I employ a system generalized method of moments (System-GMM) estimator applied to a dynamic panel data model to explore the effects of social media use in political decisions in the Netherlands. The System-GMM is acknowledged as the most efficient method to estimate dynamic panel models that suffer from endogeneity by employing (internal) IV techniques. The system-GMM allows for the dynamic

nature of political polarization and controls for unobserved, time-invariant, and individual-specific effects. Thus, the panel data analysis goes beyond the cross-sectional analysis in Chapter 3.

The findings of Chapters 3 and 4 indicate that, contrary to what is suggested by the mainstream literature, internet and social media use may not be the cause of rising political polarization across countries. Chapter 3 finds that the enhancement of feelings of hostility towards opposing candidates in Brazil, a phenomenon called affective polarization, cannot be attributed to internet or social media use. While the study identifies a positive relationship between social media usage and polarization when the internet and social media are treated as endogenous variables and a two-equation is estimated using the IV, the relationship between social media usage and polarization disappears.

Chapter 4 goes further in the research of the relationship between social media usage and political polarization and finds that, in the Netherlands, social media use attenuates rather than drives polarization, a result that holds for different measures of social media use - dummy (yes vs. no), intensity (time spent), and frequency. The study identified that reading and viewing social media has a significant and negative effect on polarization. More hours spent reading and viewing social media per week and greater frequency of social media use are associated with lower polarization.

Finally, Chapter 5 concludes the dissertation by answering the research questions and identifying the policy implications and limitations of the dissertation before suggesting avenues for future research.