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"Essays on Automation and Social Insurance"

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The domain of automation has enlarged significantly over the last decade. Technologies like machine learning, cloud computing, and computer vision have enabled the automation of tasks that previously believed only could be performed by humans. The growth of these technologies over the last decade has been likened to the Cambrian explosion; a period of rapid growth and diversification of life half a billion years ago (Pratt, 2015). In a study, Osborne and Frey (2013) estimated that as much as 47% of the US jobs are susceptible to automation in the coming years. Moreover, a recent survey revealed that AI experts believe there is a 50% chance of AI outperforming humans in all tasks in 45 years. (Grace, Salvatier, Defoe, Zhang, Evans; 2017)

In the first chapter of my dissertation, I highlight the importance of occupational transition costs in assessing the impact of automation. In the absence of such costs workers can find other jobs with ease and automation does not pose a problem for the labor market. However, when costs are substantial, finding new jobs is difficult and automation may increase unemployment. Therefore, understanding these transition costs are key to understand possible consequences of automation. In order to quantify such transition costs I propose to estimate a dynamic discrete choice model of occupational choice using Survey of Income and Program. Preliminary findings suggest workers face significant costs in moving to other occupations.

In the second chapter; I focus on policy responses to automation. In particular, I model automation as a future event in which some occupations will disappear from occupational choice set. As transitions between occupations are costly, workers in automated occupations faces hardships in finding suitable jobs. This provides motive for a policy directed at easing transition of such workers to the occupations that will not be automated. This chapter analyzes the optimal design of such policies.

In the third chapter; a joint project with Laurence Ales and Chris Sleet, we study an environment where economic opportunities and wages are unevenly dispersed across locations. The risk of being born in and having a personal attachment to a low wage location creates a motive for social insurance. Policymakers must trade this motive off against its adverse impact on location choice and immigration. Our paper analyzes this trade-off by developing a theory of optimal geographic social insurance.