Abstract

In this thesis, I study the adaptation of workers to labor market disruptions, with emphasis on adaptation to technological change, through the lens of structural life-cycle models of skill investment and occupational choice. In the first chapter, I use a life-cycle model of human capital investment and occupational choice to link the adaptive capacity of workers with different learning abilities to earnings inequality that arises in the process of routine-biased technological change (RBTC). Estimating the model on NLSY79 and CPS data, I establish that the responses of workers with higher learning ability in routine occupations, who adapt to RBTC by accumulating additional human capital and switch to non-routine cognitive occupations, significantly dampen an RBTC-induced increase in the non-routine cognitive wage premium.

The second chapter focuses on how generations of workers adapt to routine-biased technological change by altering their career paths. We develop a model which endogenously generates realistic career paths across routine and non-routine occupations over worker' lifetimes and estimate it using PSID data and job ad data from three major US outlets covering the period from 1940 to 2000. We show that, in the course of RBTC, the disappearance of a subset of routine occupations used as stepping stones can decrease the chances of workers from younger cohorts to progress towards high-skilled non-routine cognitive occupations later in the life cycle. While a significant share of younger workers adapts by altering their career paths towards the high-skilled occupations, these alternative paths are often associated with human capital depreciation affecting the wage distribution for younger cohorts of non-routine cognitive workers.

In the third chapter, I extend the economic model of workers' decision-making to account for the characteristics of environment that are considered the most important in adaptation theory in biology and ecology — sciences that study and predict adaptation in a wide variety of contexts for some of the most diverse entities in the universe. I then estimate the economic model informed by adaptation theory in biology and ecology on the NLSY79 and O*NET data and use it to quantitatively evaluate the adaptation predictions delivered by biology and ecology in the context of labor markets. The universality of the results delivered by many decades of adaptation research in biology and ecology allows me to analyze the adaptive responses of workers across different contexts within a single framework, to predict the consequences of major labor market disruptions, such as automation, the introduction of AI, and climate change.