

# Essays on technology adoption and the labor market

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# Summary

While the benefits of technological progress are undeniable, it also brings forth numerous challenges, such as environmental degradation, political polarization, and inequality. Empirical studies have shown that technology has been a critical ingredient of economic growth and a key driver of productivity differences across firms and countries. However, there is a pressing need for more empirical studies focused on understanding the dynamics behind technology adoption and its impact on the labor market, especially in the context of developing and emerging economies.

This dissertation addresses this need by investigating the drivers of technology adoption and the links between technology and the labor market in developing economies. Chapter 2 comprehensively examines the interconnections between technology and employment in the context of developing and emerging economies, with a particular emphasis on job polarization - the relative decline of jobs in the middle of the wage and skill distribution. The results suggest that job polarization in emerging economies is only incipient compared to other advanced economies, which I argue is related to differences in technology adoption, structural change, and countries' participation in global value chains.

Despite the lack of job polarization, recent analysis suggests that there is a decline in the demand for routine jobs in emerging and developing economies. Chapter 3 empirically tests the hypothesis that, as a result of this reduced demand, the negative effect of job displacement runs differently for workers in routine-intensive occupations. We use firms' mass layoffs and bankruptcy as an external shock to workers' careers and apply a difference-in-differences model to estimate the effect of job displacement on workers' careers. Consistent with our hypothesis, the results suggest that workers in routine-intensive occupations face a more significant decline in wages and longer periods of unemployment and that the effects are larger for older and long-tenured individuals.

Older and long-tenured workers encounter more difficulties in the labor market as they find it more difficult to move to different sectors and occupations. Chapter 4 studies labor market mobility from a worker's set of occupational skills and its transferability to other occupations. We build an occupational skills commonality index and apply a difference-in-differences model taking firms' layoffs and closure as the critical event in workers' employment trajectory. The results indicate that a higher occupational commonality index leads to shorter periods of unemployment and increases the probability of switching to another occupation. In addition, we explore

how skill mismatch affects workers' wages upon reemployment and find that movements to similar occupations lead to higher wages.

Chapter 5 focuses on the adoption of advanced technologies and their drivers and examines the effects of entering exporting markets on firms' adoption of more sophisticated technologies in Brazil. We combine a novel dataset on firms' adoption of specific advanced technologies with a dataset on the year they start to export. Using a difference-in-differences model, we find that starting to export is linked to a larger probability of adopting specialized software or ERP for business administration and a larger probability of adopting statistical process control with software monitoring and data management for inspection in quality control. On the one hand, the findings are consistent with a model in which exporting increases firms' complexity, and they adopt sophisticated technologies to cope with it. On the other hand, it also underlines the role of firms' interactions with buyers in reducing information asymmetries and spurring technology adoption.

In conclusion, this dissertation contributes to our understanding of the complex relationship between technology, employment, and labor market outcomes in developing economies. It underscores the need for policymakers to foster technology adoption and design effective policies that mitigate the adverse effects of technology adoption and ensure a more equitable distribution of its benefits. The empirical evidence presented in this dissertation provides a solid foundation for policymakers to make informed decisions and design policies that promote inclusive growth and development.