

Technology and Skill Upgrading Effects of Globalization: An Applied General Equilibrium Approach

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The globalization process has been intensified at an unprecedented speed over the last decades due to revolutionary advances in transportation and communication technologies. Over the last decades, applied general equilibrium (AGL) also referred to as computable general equilibrium (CGE) models have accordingly widely been used by governmental organizations and academic institutions to analyze the economy-wide effects of various globalization processes, and have become an indispensable tool of modern quantitative policy analysis in all field of economics. Though there have been considerable advances in CGE models over the last decades, however, the representative agent frameworks have been criticized as overly simplistic to reflect the real world. Indeed, recent rapidly growing firm heterogeneity and/or assignment and globalization literatures in international trade study the equilibrium skill allocation to different technologies, and have been highlighting that equilibrium matching between technology and skill itself would have considerable implications for economic performance as well as for any welfare implications.

In this paper, we aim at providing a new basic CGE framework incorporating both firm and worker heterogeneity, and thus allowing for analyzing the technology and skill upgrading effects of globalization: heterogeneous workers choose tasks (or occupations) based on their own comparative advantage, and since each task (or occupation) requires a specific-technology workers' productivity reflects not only their own skill level but also the task/occupation-specific technology they are employing in equilibrium. After constructing a base framework that can easily be extended to various large-scale CGE models, we highlight the quantitative importance of such new framework compared to previous conventional homogeneous agent framework. In particular, we show that economic integration between countries with various sectorial and country-level technological and skill gaps induces considerable quantitative implications based on such technology and skill upgrading or downgrading mechanisms, which could not be captured by conventional CGE models with homogeneous agents.