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Frontier Firms, Inefficiency and Productivity Dynamics

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Firm dynamics promote the development of economy. New firms enter the industry within innovative perspectives and experimental practices. They also serve as an essential source which intensifies competition. Old-fashioned firms lacking the ability to adapt are excluded. Industry performance is improved and aggregate productivity is enhanced due to the innovation and competition in dynamic turnover.

Despite much attention to productivity growth and firm dynamics, there has been little discussion on decomposing productivity into explanatory factors for the market turnover. Productivity can either be decomposed into contributing factors like efficiency and technical progress, which is defined as productivity decomposition, or it can be decomposed into within, between, entry and exit effects, which is defined as productivity dynamics. This paper seeks to align productivity decomposition to productivity dynamics, and to propose an economic interpretation to support productivity dynamics.

First, this paper introduces a revised model to combine productivity decomposition and productivity dynamics. With the new method for productivity decomposition, not only productivity growth can be assessed by components of incumbents, entrants and exits, but also explanatory factors of productivity are provided in firm dynamics. I decompose productivity into input mix, efficiency and technical progress so that I can specify contributions of incumbents, entrants and exits to input mix, efficiency and technical progress separately.

Second, this paper aims to enhance a casual understanding of firm dynamics. The difference in differences approach is introduced to measure the causal effect of incumbents, entrants and exits. I assume a pseudo market and compare it with the real market to specify within effect, between effect, entry effect and exit effect. These effects derived from counterfactual inference are mathematically correct and economically reasonable.

Third, I provide an extension to the framework of firm dynamics by replacing entry effect and exit effect with capacity effect and portion effect. Capacity effect measures productivity improvement and portion effect measures market share expansion. This results from the perspective that new firm enter the market with better productivity and larger market power to replace disappearing firms. It helps to take an alternative view of firm dynamics.