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## **Frontier Firms, Inefficiency and Productivity Dynamics**

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Productivity dynamics occur when firms enter and exit a market. Contributions from firms to industry productivity can be decomposed into effects from entrants, exits and incumbents. As opposed to productivity dynamics, productivity can also be decomposed into explanatory factors regarding efficiency and technical progress. These two patterns of decomposition provide different perspectives about the driving components of productivity. I propose a framework that merges them and produces a cross dimension. Industry productivity can not only be allocated as firm contributions, but also its explanatory factors can be illustrated analogously. It is developed by specifying firms that are on production frontiers, measuring the deviation from frontiers, and integrating explanatory factors with firm dynamics. A difference-in-differences approach is proposed that validates the firm dynamics from the counterfactual perspective. As an empirical exercise, the framework is applied to Australian firm-level data and reveals the dominant contribution of incumbent firms to industry productivity and industry efficiency.