

# Extending the Input-Output Table Based on Firm-level Data

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## Abstract

This paper proposes methods to extend a standard input-output (IO) table to incorporate firm heterogeneity when portraying the domestic segment of global value chains in a country. We develop a quadratic programming model that uses statistics from custom and firm census data to extend any IO table into a detailed one that reports inter-sector transactions between different types of firms. Our proposed methods permit the construction of standard errors of all estimates in our calibrated IO tables, based on random samples bootstrapped from firm census data. As an illustration, we implement our quadratic programming model using Chinese IO tables and micro-level data. We then use the extended IO tables to estimate the direct and indirect domestic value added and profits in exports of different types of firms in China. Based on our reconciled data sets for 2007 and 2010, we find that both state-owned enterprises (SOEs) and small and medium domestic private enterprises have much higher value-added exports to gross exports ratios (VAX), compared to foreign-invested and large domestic private firms. The VAX of all firm types increased between 2007 and 2010, especially for SOEs.

**Key words:** value-added trade; global supply chain; intra-national trade

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