

Title: Factor Bias and Heterogeneous Quality in Multiproduct Production

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Abstract:

We develop and estimate a structural model of multiproduct production that incorporates producer heterogeneity in input efficiency and output quality. Using plant-level data from Taiwan's textile industry, we specify a translog multiproduct cost function with input share and output supply equations, estimated via GMM without requiring product-level input allocations. The model recovers plant-specific input efficiencies and output qualities, economies of scale and scope, and substitution elasticities. We find mild increasing returns to scale, strong substitutability between labor and materials, and significant cost complementarities arising from joint production. In Taiwan's textile industry, both input efficiency and output quality trend upward over time, but heterogeneity, especially in output quality, remains large and persistent, driving differences in labor shares and revenue-cost ratios. A multilateral productivity index shows that variation in efficiency and quality is the dominant source of productivity differences across plants.