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Temperature Effects on Productivity and Factor Reallocation: Evidence from a Half Million Chinese Manufacturing Plants

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Abstract

This paper uses detailed production data from a half million Chinese manufacturing plants over 1998-2007 to estimate the effects of temperature on firm-level total factor productivity (TFP), factor inputs, and output. We detect an inverted U-shaped relationship between temperature and TFP and show that it primarily drives the temperature-output effect. Both labor- and capital- intensive firms exhibit sensitivity to high temperatures. By mid 21st century, if no additional adaptation were to occur, we project that climate change will reduce Chinese manufacturing output annually by 12%, equivalent to a loss of \$39.5 billion in 2007 dollars. This implies substantial local and global economic consequences as the Chinese manufacturing sector produces 32% of national GDP and supplies 12% of global exports.

Keywords: Climate Change, Productivity, Manufacturing, China

JEL Classification Codes: Q54, Q56, L60, O14, O44

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