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PROGRESS.

Brazilian Ethanol: A Gift or Threat to the Environment
and Regional Development? *

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December 30, 2008

Abstract

The Brazilian government has been pushing for changes to the United States' extensive barriers to ethanol imports. However, removing these barriers would have uncertain consequences for the environment and regional development in Brazil. Regarding the environment, the expansion in sugarcane production required to produce more ethanol could lead to greater deforestation. In terms of regional development, greater sugarcane production could be a boon to the poorer, rural parts of Brazil; but at the same time, wealthier regions of Brazil could expand production more rapidly, actually reinforcing regional inequality. This paper addresses these two issues by developing and estimating a general equilibrium model of regional agricultural and labor markets. The model allows for labor supply responses on both an extensive margin (choice of sector and region of work) and an intensive margin (choice of hours). Heterogeneity in land quality underlies land use decisions. I estimate the model using data covering the last 20 years, including rich household survey data, region-level data on production and land use, and data on the prices of key goods. I then use the estimates to simulate the general equilibrium effects of a change in US import barriers. I find that the threat to forests is minimal. The greatest expansion in sugarcane cultivation occurs in Sao Paulo, away from the most environmentally sensitive areas. Concerning the regional development issue, I find that the ethanol expansion leads to a significant rise in expected wages in all regions, with some of the largest proportional increases in very poor regions. Still, the gap in expected wages between wealthier and poorer regions does not close in general. Most of the earnings gains accrue to workers who were already working in sugarcane prior to the policy change. In part because of this, within many regions wage inequality actually increases somewhat.

*I owe a large debt to Thomas MaCurdy, John Pencavel, and Luigi Pistaferri for their advice and support during both college and graduate school. I am equally grateful to Aprajit Mahajan and Jay Bhattacharya for their encouragement and guidance over the past years. In addition, I benefited greatly from conversations with Orazio Attanasio, Nick Bloom, Andrew Foster, Zephyr Frank, Giacomo De Giorgi, Caroline Hoxby, Lovell Jarvis, Seema Jayachandran, Bryan Keating, Soohyung Lee, Colleen Manchester, Naercio Menezes-Filho, Pedro Miranda, Jonathan Meer, Marc Muendler, Kevin Mumford, Alejandro Ponce-Rodriguez, Felix Reichling, Andres Santos, Gopi Shah Goda, Frank Wolak, Joanne Yoong, attendees of Stanford's Applications Seminar, and members of Stanford's Labor Reading Group. For their immense help with acquiring data used here, I thank Steven Helfand, Frank McIntyre, Marcia Moraes, and the staff at Fundacao Getulio Vargas. I appreciate the financial support provided by SIEPR for data acquisition and by the Taube/SIEPR dissertation fellowship. Remaining errors are, of course, my own.