MODELING GEOGRAPHIC FERROUS SCRAP MARKETS:
REGIONAL PRICES AND INTERREGIONAL TRANSACTIONS
IN THE UNITED STATES*

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ABSTRACT. The U.S. Regional Ferrous Scrap Model analyzes spatial variations in
prices for two grades of ferrous scrap using a logistic model of choice under differentiated
products. The model uses a computer-generated equilibrium framework to solve for
prices that support the observed spatial distribution of supply and demand quantities.
This paper presents the model’s formal structure and its solution algorithm. The model
specification is highly disaggregated with 1,212 supply and 240 demand regions.
Characteristics of the equilibrium solution are described for prices and interregional
flows. Sensitivity of equilibrium values to changes in model parameters is reported.

1. INTRODUCTION

When Joseph Schumpeter coined the phrase “Creative Destruction” he
used U.S. Steel as an example of a company on the cutting edge of competition
(Schumpeter, 1950, p. 83). At that time, U.S. Steel was revitalizing the market
from within by beating old-line manufacturers. U.S. Steel remains a competi-
tive firm in a competitive market, but now U.S. Steel is one of a number of
firms being challenged by new competitors. Intra-industry competition in the
steel industry today is a clash of two technologies, one based on the reduction
of iron ore and its transformation into steel and the other based on the direct
melting of ferrous scrap. U.S. Steel is still one of the leading ore-based produ-
cers; the domestic challengers depend on ferrous scrap.

The geography of ferrous scrap markets, as defined by interregional scrap
flows and the spatial distribution of prices, is central to the geography of competi-
tion in steel markets. The economic model presented here characterizes regional
markets for ferrous scrap in great detail: its equilibrium is defined by a set of prices
that balances interregional flows of ferrous scrap among 1,212 supply regions and
240 demand regions, which encompass the continental United States. The model

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