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TITLE: EFFICIENCY OF INDUSTRIAL WASTE MANAGEMENT AND ITS PATH DEPENDENCY: AN ESTABLISHMENT LINKED INPUT-OUTPUT ANALYSIS IN JAPAN

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ABSTRACT:

The purpose of this paper is to estimate patterns in the differences in waste/production ratios of establishments and to study their economy-wide implications, using data from both the Survey on the Industrial Waste and By-Product (conducted by the Ministry of Economy, Trade and Industry, 2005 and 2006) and the Japanese input-output table. The above survey gives estimates for 37 types of industrial wastes generated for 4 different levels of production processes (generation, intermediate reduction, reuse-recycle, and disposal to landfill) at 5048 establishments in Japanese manufacturing industries. Using the micro survey data linked to the input-output table, and using input-output relations and the energy/CO2 requirements of industrial waste treatments, we are able to calculate induced amounts of industrial wastes. For example, waste oil and waste plastic have been widely generated at 3080 and 3694 Japanese establishments, respectively. Estimated waste oil per output (tonne/mil yen) ranges from 0 to 2.50 tonnes per million yen, and estimated waste plastic per output ranges from 0 to 2.11 tonnes per million yen. On the other hand, waste ferroalloy slug is produced at only 11 establishments, and estimated waste ferroalloy per output ranges from 5.8 to 64.6 tonnes per million yen. We also estimate, in terms of the total weight of wastes generated, that every 2 million yen worth (equivalent to one vehicle) of automobile production induces, for example, 0.2928 tonnes of waste in hot rolling process and 0.2631 tonnes of waste in iron steel making. It is estimated that 2 million yen worth of automobile production generates 1.73 tonnes of industrial wastes in total. We conclude that there is considerable room for Japanese manufacturing establishments to improve their performance in waste outputs.