WASHINGTON - Multinational corporations avoided $45 billion in US taxes last year by artificially fixing prices for transactions with foreign affiliates, according to a study released yesterday by US Senator Byron L. Dorgan.

The companies moved profits out of the United States in two ways: overpricing goods sold to US operations by foreign affiliates, and underpricing goods purchased by the foreign affiliates, the study found. This practice, known as transfer pricing, moves income out of the United States and puts company profits out of reach of the Internal Revenue Service.

Artificially high prices documented by the study include $5,655 for a toothbrush, $5,000 for a flashlight, and $2,306 for a hypodermic syringe. Examples of underpriced goods were $1.58 for a ton of soybeans, $528 for a bulldozer, and 82 cents for a prefabricated metal building.

The study by Simon J. Pak and John S. Zdanowicz, both finance professors at Florida International University, estimated the 2000 total tax loss at nearly $45 billion. Earlier studies by the pair uncovered tax losses of $42.7 billion in 1999 and $35.7 billion in 1998.

Dorgan, a North Dakota Democrat, included $2 million in the annual Treasury Department spending bill to allow the two professors to expand their studies to recommend ways the IRS can begin collecting these taxes. "Every individual and company is forced to make up the differences with income taxes that are higher than they would need to be if the international corporations who are avoiding their tax responsibility were paying their fair share," he said.

The companies involved were not identified in the study, which is based on Commerce Department trade data focused on international pricing of goods.

The study did identify countries to which income from the United States is shifted. The top five: Canada, $15.8 billion; Japan, $14 billion; Mexico, $9.9 billion; the United Kingdom, $8.8 billion; and Germany, $8.3 billion.