

# The commodity composition of US–Japanese trade and the yen/dollar real exchange rate

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## Abstract

We use a highly disaggregated data set on trade between the United States and Japan to answer three questions concerning the composition of trade. First, we ask “how has the composition of US exports to Japan and US imports from Japan changed?” Second, we ask “what are the exchange rate elasticities of each of the commodities and are they different over periods of dollar appreciation versus depreciation?” Third, we ask “are the elasticities systematically related to commodity characteristics such as durability or share of production costs that are fixed?”

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## 1. Introduction

A statistic that is probably as well-known by government policymakers and economists as it is by lay people is that the United States has consistently run a merchandise trade deficit with Japan. In 2001, the annual overall US trade deficit was US\$ 358 billion while the US trade deficit with Japan registered US\$ 69 billion. Between the mid 1970s and the mid 1990s, the trade deficit with Japan was roughly 50 percent of the overall US trade deficit. Japan continues to be one of the top sources of US imports and a stiff competitor in world export markets. Given these statistics, it may be no surprise that the trade imbalance between the United States and Japan has been and continues to be a source of economic conflict between the two countries.

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These aggregate measures of US trade with Japan do not tell the whole picture, however. Over our period of study, the United States has consistently run trade deficits with Japan in three broad commodity groups and trade surpluses with Japan in seven broad commodity groups. Moreover, the aggregate statistic on the trade balance between the US and Japan conceals many changes (or lack thereof) in the contributions of different commodities to total exports and total imports. The top US exports to Japan have increasingly become highly manufactured, highly processed goods whereas the top imports from Japan have changed hardly at all. In fact, automobiles have consistently ranked as the top import from Japan despite large changes in the value of the dollar against the yen and the imposition of voluntary export restraints in 1985. By contrast, exports of US automobiles to Japan are now ranked as one of the top five exports to Japan and as recently as 1995 were the second top ranked export to Japan.

We investigate three questions in this study. The first question is “how has the composition of US exports to Japan and US imports from Japan changed?” We answer this question with a highly disaggregated data set. Our data set includes value data on exports and imports at the three-digit *standard international trade classification* (SITC) level. We have data on over 250 commodities exported and imported between the United States and Japan. For example, our data set includes observations on heating and cooling equipment, computers, tractors, ball or roller bearings, leather, perfumes, fish (live or dead), spices, watches and clocks, meters and counters, furniture and parts, and much more. The data span the period of January 1978–November 1996 which include two distinct exchange rate episodes of dollar appreciation and dollar depreciation. The panel nature of the data set affords the opportunity to test hypotheses about exchange rate elasticities across commodities and across time.

An examination of the commodity composition of exports and imports between the United States and Japan is illuminating in its own right and is called for in academic studies. To our knowledge, there is scant academic work conducted on the US–Japanese trade imbalance that uses data disaggregated at more than the one-digit level of detail. Indeed, a large proportion of articles focus on total trade volumes. (see: Backus, 1998; Ceglowski, 1997; Hooper and Marquez, 1995; Cline, 1993; Petri, 1991; Butler, 1991; Corker, 1989; Sakamoto, 1988). There is even less research conducted by academia and other research institutions on disaggregated measures of US–Japanese trade.<sup>1</sup> An investigation into the commodity composition of US trade with Japan may also be illuminating because it may provide insight into the behavior of the bilateral trade balance with Japan in the same way that the commodity composition of output is being linked to explanations of the behavior of GDP (c.f. Watson, 1994; Stockman, 1988, and relatedly Haimowitz, 1996).

The second question is “what are the exchange rate elasticities of each of the commodities and are they different over episodes of appreciation versus depreciation?” The disaggregated nature of the data will allow us to substantiate cross-commodity differences in exchange rate elasticities that are typically undetected in empirical work that uses highly aggregated data. Differences in exchange rate elasticities could help explain commodity-specific trade behavior that could have implications for the overall

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<sup>1</sup>Noland (1997), Gagnon and Rose (1992) and Hickok (1991) are exceptions. Gagnon and Knetter (1995), Knetter (1994), Parsley and Wei (1993), and Kasa (1992) conduct studies using disaggregated bilateral export and import data for only a handful of commodities. Lenz (1992) undertakes a disaggregated study of the total US trade balance.

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