Pass-Through of Oil Prices to Japanese Domestic Prices

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Abstract

Recent dramatic surge and fall of crude oil prices have renewed interest in their effects on domestic economies. In this paper, we investigate changes in the influences of world crude oil prices on domestic prices in Japan. We conduct two types of analyses. First, we employ a VAR methodology as well as a time-varying parameter VAR (TVP-VAR) approach to conduct detailed analyses on how the pass-through rate of oil prices has evolved over time. We confirm the declining pattern of the pass-through rate, both at the aggregate and sectoral levels for the period 1980-2000. Second, we study how the declining pass-through during this period is related to the changing cost structure of Japanese firms, by computing the importance of oil in production costs of various types of products in Japan from Input-Output Tables. Comparison between the TVP-VAR results and the I-O analysis results indicates that structural changes in cost structure goes a long way toward explaining the decline in the pass-through rate of oil prices. That is, by the year 2000, oil had become a much less important component of the Japanese production cost structure. This change can be further decomposed into (1) the relative price changes (i.e., the lower oil prices reduce the cost share of oil), and (2) the substitution effects or the quantity effects (i.e., in reaction to the oil past crises, households and firms buy less quantities of oil-intensive goods or employ technology that is more oil-saving). It turns out that the former is much more important in explaining the long-run decline in the pass-through rate: that is, as oil became cheaper, it became less and less important in the overall cost structure, and thus the pricing behaviors of the firms became less responsive to its prices. The substitution or the quantity effects played secondary but sometimes important roles, mainly in the short run.

We also study changing influences of oil prices during the period 2000-2007. As one would expect from the above analysis, we find that, as oil prices go through historical surges, pass-through rates of oil prices increase in many instances. However, those increases are muted and delayed in comparison to the drastic increases in oil prices. We present some possible explanations for this fact.