Trade adjustment and the composition of trade

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Abstract

A striking feature of U.S. trade is that both imports and exports are heavily concentrated in capital goods and consumer durables. However, most open economy general equilibrium models ignore the marked divergence between the composition of trade flows and the sectoral composition of U.S. expenditure, and simply posit import and exports as depending on an aggregate measure of real activity (such as domestic absorption). In this paper, we use a DSGE model (SIGMA) to show that taking account of the expenditure composition of U.S. trade in an empirically realistic way yields implications for the responses of trade to shocks that are markedly different from those of a 'standard' framework that abstracts from such compositional differences. Overall, our analysis suggests that investment shocks, originating from either foreign or domestic sources, may serve as an important catalyst for trade adjustment, while implying a minimal depreciation of the real exchange rate.
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1. Introduction

A striking feature of U.S. trade is that both imports and exports are heavily concentrated in capital goods and consumer durable, with roughly three-quarters of U.S. non-fuel imports and exports appearing to fall into these categories. This contrasts with the relatively low production share of the capital goods and consumer durables sectors in the U.S. economy of under 20%. But despite the marked divergence between the composition of trade flows and the sectoral composition of U.S. production, open economy models typically posit imports and exports as depending on an aggregate measure of activity such as real GDP or domestic absorption (as well as on relative prices).[1]

In this paper, we show that a modeling framework that takes account of the expenditure composition of U.S. trade in an empirically realistic way yields implications for the responses of trade to shocks that are markedly different from those of a 'standard' framework that abstracts from such compositional differences. Our methodology consists in contrasting the implications of alternative versions of an open economy DSGE model ('SIGMA') that embed different trade specifications.[2] In the version adopting a commonly used trade specification, the activity variable driving real imports is simply domestic absorption, while exports depend on foreign absorption. We refer to this version as the absorption-based trade (AT) specification. In contrast, our benchmark version of SIGMA posits separate behavioral equations for trade in non-durable consumer goods and for trade in investment goods, where the latter includes both consumer and producer durables (i.e., capital goods). These behavioral equations are derived from underlying technologies for producing final consumer and investment goods that differ by allowing the production of investment goods to be more import-intensive. We refer to this version as the disaggregated trade (DT) specification.[3] From an intuitive perspective, the activity variable driving imports and exports in the DT specification weights consumption and investment by their share in trade, rather than by their share in production: this implies an effective weight on investment in the import and export demand functions that is several times larger than in the AT specification.

We examine the responses of each model variant to several domestic and foreign shocks. We show that the differences in implications across the alternative trade specifications are particularly large for shocks which exert disparate effects on consumption and investment spending either at home or abroad. Examples include

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[1]Examples of studies that specify imports as depending on absorption include: Backus et al. (1994), Chari et al. (2002), Laxton and Pesenti (2003).

[2]An extended description of the model and its properties with respect to a wide range of shocks is given in Erceg et al. (2006).

[3]Our DT specification is closely related to important prior work by Boileau (2002). Boileau formulated an international real business cycle model allowing for differential import intensities for consumption and equipment investment, and showed that it could generate greater volatility of net exports than typical AT specifications. While Boileau focused on explaining the unconditional volatility of trade in response to technology shocks, we analyze the time-series behavior of imports more broadly, and consider trade adjustment in response to a variety of shocks.