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International interdependence and the welfare effects of monetary policy ☆

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Abstract

A vertical chain of production and trade along this chain have been found to be a characteristic feature of globalized markets. This paper examines how a multistage production process that involves more than one country affects the transmission of monetary policy changes. We assume that imported and domestic inputs are required to produce final consumption goods. Monetary policy may have adverse beggar-thyself effects if the mutual dependence between countries is considerably high. The foreign country benefits from a home monetary expansion unless the competitiveness of markets is too low.

JEL classification: F31; F32; F41; F42
Keywords: Intermediate goods; Monetary policy; Home bias; Beggar-thy-neighbor; Prosper-thy-neighbor

1. Introduction

A central issue in international macroeconomics is the welfare effects of monetary policy. What the welfare consequences for domestic agents are, and how monetary adjustments are transmitted to other economies, are key questions in this respect. The conventional wisdom that an expansionary monetary

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policy is beneficial for the expanding country and detrimental for the rest of the world has been questioned and qualified in recent theoretical work by Obstfeld and Rogoff (1995, 1996). In their studies, an expansionary monetary policy anywhere in the world benefits all countries equally. Monetary policy thus does not generate the familiar beggar-thy-neighbor effects but rather, prosper-thy-neighbor effects. Several papers have since modified the Obstfeld and Rogoff framework through the consideration of, e.g., nontraded goods (Hau, 2000), a limited pass-through of exchange rate changes (Betts & Devereux, 1996; Betts & Devereux, 2000), different degrees of substitutability between varieties of home goods and between domestic and foreign goods (Corsetti & Pesenti, 2001a; Tille, 2001), a home bias (Michaelis, 2002; Warnock, 2003) and a production process consisting of more than one stage (e.g., Obstfeld, 2001; Tille, 2000). Beggar-thy-neighbor effects reappear in a number of these models. Even the possibility of a detrimental beggar-thyself effect for the expanding country emerges (see, e.g., Tille, 2001).

Starting from the controversial welfare results that have been obtained in new open economy macroeconomics (NOEM) models, this paper seeks to reexamine the welfare effects of monetary policy by accounting for one of the most important changes in the nature of international trade (Hummels, Ishii, & Yi, 2001; Yi, 2003). The production sequence of final consumption goods stretches across many countries and is increasingly associated with vertical trade. Goods are produced in a vertical production chain that involves cross-border trade in inputs. In the light of these changes, the interdependence of countries is increasingly based on trade along vertical production chains.

We suppose that each country produces a continuum of differentiated intermediate and final consumption goods. The intermediate goods are not directly consumed but used as inputs in the production of consumption goods. This set-up allows us to capture some important characteristics of global trade and production. Consumption goods are produced in sequential stages, more than one country provides value-added in the production process and at least one stage involves the use of imported input goods.[1] Furthermore, a home bias in the production of consumption goods is introduced.[2] If a home bias in production exists, domestic firms use relatively more home inputs than foreign firms. Hence, the willingness to substitute domestic for imported input goods in response to terms of trade changes declines. Thus we are able to vary the mutual interdependence of economies on the production side. In addition, another variable determining the economies' interdependence is explicitly considered. The substitutability of inputs in the production processes (reflecting the competitiveness of markets) also affects the welfare changes in the aftermath of a monetary policy change.

By deviating from the standard NOEM approach through the consideration of trade in inputs and merging some of the extensions found in the literature into a unified framework, we are able to contrast critical factors that pull the welfare results in opposite directions. The model's main results can be summarized as follows. Generally, the impact of a home monetary policy change is not unambiguous for either the home or the foreign country. An expansionary monetary policy is more

[1] See Hummels et al. (2001). The authors point out that another key aspect of their concept of vertical specialization is the use of imported inputs in producing goods that are not only domestically consumed but also exported. We abstract from this issue here by assuming that all consumption goods are nontradables, that is, only intermediate goods are traded.

[2] Michaelis (2002) and Warnock (2003) analyze the welfare effects of monetary policy when a home bias in consumption exists.