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Journal of International Economics 70 (2006) 428–450

Journal of INTERNATIONAL ECONOMICS

www.elsevier.com/locate/econbase

Macroeconomic interdependence under incomplete markets

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Received 6 May 2005; received in revised form 26 November 2005; accepted 22 December 2005

Abstract

This paper uses a two-country, flexible-price model with overlapping generations of infinitely lived households to study the role of net foreign asset dynamics in the propagation of productivity shocks. Absence of Ricardian equivalence ensures existence of a unique steady-state level of net foreign assets, to which the economy returns following temporary shocks. Model dynamics are significantly different from those of a setup in which terms of trade movements perform all the international adjustment and net foreign assets do not move. The difference relative to a complete markets economy in which net foreign asset movements play no role in shock transmission is smaller. It is amplified if the substitutability across goods rises and if shocks are permanent.

Keywords: Current account; Incomplete markets; Net foreign assets; Ricardian equivalence; Stationarity

JEL classification: F41; G15

1. Introduction

This paper uses a two-country, flexible-price model with overlapping generations of infinitely lived households and incomplete asset markets to study the role of net foreign asset dynamics in the propagation of productivity shocks.

Changes in net foreign assets play a role in the international transmission of shocks in representative agent, open economy models with incomplete asset markets through the history

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0022-1996/$ - see front matter
doi:10.1016/j.jinteco.2005.12.006

dependence of the equilibrium allocation encoded in a country's asset stock.[1] For instance, the current account plays a central role in Obstfeld and Rogoff's (1995a) model that sparked much literature in recent years. But the inability of the model to pin down a unique, endogenously determined steady state and the implied non-stationarity of the framework caused much of the subsequent literature to de-emphasize changes in net foreign assets as an important mechanism for the propagation of shocks across countries and over time.[2]

Determinacy of the (non-stochastic) steady state and stationarity fail in incomplete market models that do not address the issue in some way because consumption growth does not depend on net foreign assets in the Euler equation for bond holdings. Hence, setting consumption to be constant does not pin down steady-state assets.[3] This makes the choice of the economy's initial position for the purpose of analyzing the consequences of shocks a matter of convenience, with unfavorable consequences for the results of standard log-linearization.[4]

A possible way of addressing the problem is to assume that the elasticity of substitution between domestic and foreign goods in consumption is equal to one and the initial net foreign asset position is zero. These are the central assumptions in Corsetti and Pesenti's (2001) rendition of the Obstfeld-Rogoff model, building on insights in Cole and Obstfeld (1991). Under these assumptions (henceforth, the CO-CP model), the current account does not react to shocks, and thus it plays no role in the international business cycle. The dynamics of the terms of trade are the centerpiece of international adjustment.

Nevertheless, the steady state remains indeterminate in the CO-CP model. The choice of a zero-asset initial equilibrium, combined with the assumption on the elasticity of substitution between domestic and foreign goods, de facto shuts off the current account channel. This yields a highly tractable framework at a cost in terms of realism. Any initial position that differs from zero assets brings model non-stationarity back to the surface. In addition, the trade literature abounds with estimates significantly above one for the elasticity in question (for instance, see Lai and Trefler, 2002, and references therein).

An alternative way of dealing with the non-stationarity problem by de-emphasizing the role of net foreign asset dynamics consists of assuming that financial markets are internationally complete. With complete markets, power utility, and unitary elasticity of substitution between domestic and foreign goods, the current account does not react to shocks in two-country models with zero initial net wealth that are popular in the literature. If the elasticity of substitution between domestic and foreign goods differs from one, the current account moves in response to output differences (even though perfect risk sharing ensures that the cross-country consumption differential is zero if purchasing power parity holds). However, history independence of the equilibrium allocation ensures that net foreign assets are determined residually and their dynamics play no active role in shock transmission. Like the CO-CP specification, market completeness yields highly tractable models suitable for stochastic analysis at a cost in terms of realism.[5]

[1] See Ljungqvist and Sargent (2004) on the properties of incomplete market economies.

[2] All shocks (including temporary ones) have permanent consequences on the consumption differential between countries in Obstfeld and Rogoff's model. Asset holdings change permanently to a new level, which depends on the initial one and becomes the new steady state until the next shock happens.

[3] This result dates back at least to Becker (1980).

[4] As Schmitt-Grohé and Uribe (2003) point out, in a stochastic environment, the unconditional variances of endogenous variables are infinite, even if exogenous shocks are bounded. In such an environment, one is left wondering about the sustainability of foreign debt.

[5] As pointed out in Obstfeld and Rogoff (2001), the complete markets assumption is at odds with empirical evidence. Several other studies have pointed out that market incompleteness is necessary to explain important puzzles in international finance.