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# Financial autarky and international business cycles<sup>☆</sup>

Jonathan Heathcote<sup>a,b</sup>, Fabrizio Perri<sup>c,d,e,\*</sup>

<sup>a</sup> *Department of Economics, Duke University, Durham, NC 27708, USA*

<sup>b</sup> *Department of Economics, Georgetown University, Washington, DC 20057, USA*

<sup>c</sup> *Department of Economics, Stern School of Business, New York University, 44 West 4th Street, New York, NY 10012, USA*

<sup>d</sup> *Department of Economics, Princeton University, Princeton, NJ 18544, USA*

<sup>e</sup> *CEPR, 90–98 Goswell Road, London EC 1V 7RR, UK*

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## Abstract

We present a two-country, two-good model in which there do not exist any markets for international trade in financial assets. We compare the predictions of this model to those of two other models, one in which markets are complete and a second in which a single non-contingent bond is traded. We find that only the financial autarky model can generate volatility in the terms of trade similar to that in data for the floating rate period and, at the same time, account for observed cross-country output, consumption, investment and employment correlations. We interpret our findings as evidence that the extent of international borrowing and lending opportunities is important for the international business cycle. © 2002 Elsevier Science B.V. All rights reserved.

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\*Corresponding author. Tel.: +1-212-998-0251; fax: +1-212-995-4218.

*E-mail address:* fperri@stern.nyu.edu (F. Perri).

## 1. Introduction

International real business cycle models with complete markets (see, for example, Backus, Kehoe and Kydland, hereafter BKK, 1994 and 1995) have trouble accounting for at least three features of international data. Firstly, empirical cross-country consumption correlations are generally similar to cross-country output correlations, whereas existing models typically produce consumption correlations much higher than output correlations. Secondly, investment and employment tend to be positively correlated across countries, whereas the models predict a negative correlation. Thirdly, models generate far less volatility in the terms of trade and the real exchange rate than is seen in the data.

These failures can be understood as follows. The existence of complete markets implies insurance of country-specific risk and the efficient use of resources. Risk sharing induces strong positive cross-country consumption correlations. Efficiency dictates that the optimal response to a productivity shock involves increasing investment and labor supply in the more productive country and reducing them in the less productive country. Thus the cross-country correlations of factor supplies and output in the models are lower than those observed empirically. The equilibrium real exchange rate in complete markets models is closely related to the ratio of consumptions across the two countries. Since consumption is highly correlated across countries in the models, this ratio displays low volatility, and the real exchange rate is consequently less volatile than in the data.

This discussion suggests that introducing frictions in international asset markets might help to resolve some puzzles. Baxter and Crucini (1995), Kollman (1996) and Arvanitis and Mikkola (1996) study economies in which the only asset traded internationally is a non-contingent bond. They find that equilibrium allocations look different from those arising when markets are complete only if productivity shocks are very persistent and do not spill over across national borders.

In this paper we consider an economy in which there do not exist *any* markets for international asset trade, or, equivalently, in which all international goods trade must be *quid pro quo*. We call this the financial autarky model, following Cole and Obstfeld (1991) who studied this market structure in an exchange economy. We extend Cole and Obstfeld's work by modeling production explicitly in the standard real business cycle tradition. In related work, Kehoe and Perri (2002) show that severe restrictions to international asset trade can arise endogenously as a consequence of limited enforcement of international contracts.

The central part of the paper consists of a comparison of the usual business cycle statistics for the financial autarky economy with those emerging in economies with a single bond and with complete asset markets. This is done for a range of values for the elasticity of substitution between domestic and foreign traded goods, and for a range of specifications for the productivity shocks that are the source of uncertainty in our economies.

We find that the financial autarky economy always behaves very differently to the complete markets one, while the equilibrium allocations in the bond economy generally closely approximate those when markets are complete. We also find that

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