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Obstfeld and Rogoff's international macro puzzles: A quantitative assessment ☆

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ABSTRACT

Obstfeld and Rogoff (2001) propose that trade frictions lie behind key puzzles in international macroeconomics. We take a dynamic multicountry model of international trade, production, and investment to data from 19 countries to assess this proposition quantitatively. Using the framework developed in Eaton et al. (2016), we revisit the puzzles in a counterfactual world without trade frictions in manufactures. Removing these trade frictions goes a long way toward resolving a number of puzzles. The dependence of domestic investment on domestic saving falls by half or disappears entirely, mitigating the Feldstein and Horioka (1980) puzzle. Changes in nominal GDPs in U.S. dollars become less variable across countries and line up with changes in real GDPs as much as with real exchange rates, mitigating the exchange rate disconnect puzzle. Less dramatically, changes in consumption become more correlated across countries, mitigating the consumption correlations puzzle and changes in real exchange rates become less variable across countries, mitigating the relative purchasing power parity puzzle.

1. Introduction

International macroeconomics has grappled with a number of empirical regularities that are at odds with the simplest canonical model of the international macroeconomy. This canonical model assumes complete markets, frictionless trade (at least for some sectors), and a national representative household with a constant discount factor. Financial market incompleteness is one explanation for the gap between this formulation and the data. In a provocative paper, Obstfeld and Rogoff (2001, henceforth OR) propose, instead, that trade frictions alone could explain these "puzzles," with no financial market incompleteness required.[1]

Their proposition, if true, would be satisfying for a number of reasons. For one thing, there are myriad ways in which financial markets can be incomplete. Hence a particular puzzle could be resolved by assuming a particular friction consistent with it, imposing little discipline on the endeavor. For another, the force of gravity is strongly evident in the trade data,

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[1] Dumas (1992) is an earlier paper showing how trade frictions limit financial market integration.

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providing a means of measuring the magnitude of trade frictions. OR's account thus holds out the hope of explaining a wide range of observations in international trade and in international macroeconomics with a single force that is fairly easy to quantify.

OR show how trade frictions have the potential to resolve these puzzles qualitatively. Since they pursue their analysis in a set of stylized two-country examples, their ability to show how far this explanation can go quantitatively is limited. As Engel (2001) writes in his comment on their paper, "OR provide us with extraordinary intuition for why goods markets move things in the right direction, but we need more study to be able to reconcile their compelling but simplified examples with the results that emerge from simulation of more fully specified dynamic models." According to the notes on the general discussion of OR at the *NBER Macroeconomics Annual* conference in 2000, "John Leahy expressed the concern that the effects identified in this paper might turn out to be quantitatively small in a realistically calibrated model."

A barrier to the quantitative analysis of OR's proposition is the technically daunting task of introducing trade frictions into a multi-country dynamic framework. Dealing with a finite number of goods with trade frictions requires grappling with a taxonomy of cases, depending on whether a particular good is traded and, if so, in what directions. As the number of goods or countries rises, the taxonomy explodes.[2]

Eaton et al. (2016, henceforth EKNR) recently developed a multicountry dynamic model of international trade and production, with complete markets, to investigate the forces behind the collapse of trade in the Global Recession of 2008–2009 and its recovery in the aftermath. Their methodology allows for an arbitrary number of sectors (each with a continuum of goods) and countries. It is amenable to realistic calibration with readily available data.

EKNR's methodology relates changes in trade, production, spending, and prices across four sectors in each country to underlying shocks in every country, most importantly shocks to trade frictions, productivity, the efficiency of investment, and intertemporal preferences. The framework is one of dynamic equilibrium accounting, in the spirit of Chari et al. (2007), but in a multicountry context: Together, the shocks fully explain the data. To dissect the forces underlying the trade collapse, EKNR shut down various subsets of shocks and recompute the equilibrium to isolate those most responsible for what happened.

In this paper we apply EKNR's framework to quantify the role of trade frictions in explaining five of OR's puzzles. Since in our methodology the underlying shocks explain the data perfectly, the model necessarily captures any puzzle. To give OR's explanation substance we compare the puzzles in the data (which are accounted for in our baseline model) with a counterfactual in which we eliminate trade frictions in manufactures, but hold other shocks at their baseline values. This counterfactual lets us observe a world like the one we live in only without these trade frictions. The disappearance of a puzzle in this counterfactual vindicates OR's explanation. To the extent that a puzzle survives, forces other than trade frictions must be at work.

Our results provide quantitative support for OR's proposition. Not surprisingly, removing trade frictions in manufactures eliminates home bias for those goods. More interesting is that eliminating trade frictions in manufactures greatly reduces the correlation between national investment and saving rates, mitigating the Feldstein–Horioka puzzle. Real consumption becomes positively correlated across countries on average, mitigating the consumption correlations puzzle. Price changes become much less variable across countries, even for nontraded goods, mitigating the relative purchasing power parity (RPPP) puzzle. Changes in nominal GDP (translated into a common currency) become less variable across countries and more in line with changes in real GDP, mitigating the exchange rate disconnect puzzle.

A number of researchers have pursued OR's argument in directions different from ours. Corsetti et al. (2008) explore the role of trade frictions in risk sharing and in the relationship between real exchange rates and relative consumption, the Backus and Smith (1993) puzzle. Coeurdacier (2009) assesses the ability of trade frictions to explain home bias in equity holdings. Fitzgerald (2012) shows that, for OECD countries, geographic factors alone can explain cross-country deviations from perfect consumption risk sharing.[3]

Complementary to our analysis here are Reyes-Heroles (2015) and Alessandria and Choi (2015). Using a related framework, Reyes-Heroles shows that, if trade frictions had not declined since 1970, global trade imbalances would now be much closer to zero. Alessandria and Choi attribute roughly half of the growth in the U.S. trade deficit from the 1980s through the 2000s to global trade integration.

We proceed as follows: Section 2 presents our data. Section 3 reviews the puzzles and examines the extent to which they appear in our data. How we adopt the EKNR framework to the task at hand is the topic of Section 4. In Section 5 we create a counterfactual world without trade frictions in manufactures but with the other shocks driving the world economy unchanged. We repeat the exercises performed on the actual data in Section 3 with data generated in this counterfactual world. The elimination or diminution of a puzzle supports OR's proposition.

[2] As OR recognize, using a continuum of goods as in Dornbusch et al. (1977) alleviates some of the problem, but one is still stuck with only two countries.

[3] Rabitsch (2012) examines the role of trade frictions for monetary policy.

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