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On the distribution of exchange rate regime treatment effects on international trade

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ABSTRACT

This paper provides evidence of heterogeneous treatment effects on trade for six different types of exchange rate regime transitions, utilizing data on 218,643 country-pair-year observations all together. Previous research mainly focused on the currency union effect on trade and widely assumed that country-pairs with identical observable characteristics receive the same effect. We test the hypothesis of a homogeneous treatment effect empirically and find substantive statistical support for the presence of effect heterogeneity. Moreover, we characterize the probability distribution of effect heterogeneity among observationally equivalent country-pairs by way of a random coefficients model. We estimate selected features of the empirical distributions of the treatment effects for each of the six different types of exchange rate regime transitions under two different sets of assumptions about the probability distribution of effect heterogeneity. Our findings suggest that the immediate effects on trade from switching to an exchange rate regime different from the one in the outset have wide waists and exhibit large positive extreme values. We estimate the probability of two countries to experience an immediate positive effect on the growth of bilateral trade due to the adoption of any new exchange rate regime (tighter or not) to be approximately one-half.

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What is the effect of a common currency on international trade? Answer: Large. Rose (2000, P. 9)	*... the point estimates are positive, but the prediction that a common currency increases trade is qualified by substantial uncertainty.* Perrson (2001, P. 446)	*"On the average" has never been a satisfactory statement with which to conclude a study on heterogeneous population.* Buchinsky (1994, P. 453)

1. Introduction

Empirical research at large suggests that fixed exchange rate regimes lead to an increase in bilateral trade flows among country-pairs.[1] Yet, there is only little consensus about the magnitude of the effect.[2] Some researchers even came to doubt, whether fixed exchange rate regimes stimulate trade at all.[3]

In this paper, we consider ex-post heterogeneity of short-run treatment effects from adopting a new exchange rate regime on two countries' bilateral trade. Previous studies have limited their attention to the study of the *average* treatment effect. Our findings supplement previous research on the topic by considering the exchange rate regime treatment effect on trade as a random variable that varies over country-pair-year observations, and thus, pointing attention at an empirical analysis motivated as the study of the behaviour of a random variable.

Controlling for macroeconomic shocks by means of fixed effects, under heterogeneous responses, it follows that a randomly-drawn country-pair's exchange rate regime treatment effect on trade is not generally equal to the average effect (a parameter of the effect's distribution), but it is associated with ex-post uncertainty generating a probability distribution of possible effects. Thus, under the paradigm of treatment effect heterogeneity, adopting a new exchange rate regime results in a diffuse pattern of responses of bilateral trade that we want to study here.

Our empirical analysis reveals features of effect heterogeneity for six different types of exchange rate regime transitions, where the exchange rate regime variable is consistent with the de-facto exchange rate regimes classification of Reinhart and Rogoff (2004) that we further collapse into the three classes: freely floating, currency band, and a fixed regime (peg or currency union). In particular, we compare country-pairs who switch from one regime in the outset into another one (treated) with ones that stay in the same regime as before (controls).

The transitions between exchange rate regime states are assumed to be non-random but determined by two countries' history of exchange rate regime tightness, economic volatility, relative factor endowments, bilateral market size, geography, common culture, and common macroeconomic shocks specific to the year of an observed exchange rate regime transition. The empirical analysis rests on data of 218,643 country-pair-year observations between 1967 and 2001.

Using the data and methods discussed in more detail below, the empirical findings in this paper suggest the following. First, the response of two countries' growth of bilateral trade is not homogeneous immediately after adopting a new exchange rate regime for most of the considered transitions. Second, the impact distributions are found to be non-normal, have wide waists, and exhibit large

[1] See Rose (2000, 2001), Rose and van Wincoop (2001), Frankel and Rose (2002), Glick and Rose (2002), Levy Yeyati (2003), Engel and Rose (2002), Barro and Tenreyro (2006), Klein and Shambaugh (2006), Egger (2008). Rose and Stanley (2005) provide a meta-analysis of earlier work. Evidence of a positive impact of fixed exchange rates on bilateral trade is consistent with evidence on the detrimental effect of exchange rate risk and volatility on trade flows (see Cushman, 1983; Brada and Mendez, 1988).

[2] Though not intended to be exhaustive, Rose (2000), Klein and Shambaugh (2006), and Egger (2008) are some of the studies considering an augmented gravity equation to estimate the effect of currency tying on bilateral trade. Whereas Rose (2000, 2001) estimates a huge positive effect on trade of about 270%, Klein and Shambaugh (2006) find a more moderate positive effect of 16–35%, and Egger (2008) estimates a much smaller increase in bilateral trade due to increased currency tying of about 2–4% when moving from one to the next level of tightness on the fine tightness grid of de-facto exchange rate regimes in Reinhart and Rogoff (2003a,b, 2004).

[3] Work which cast doubt on significantly positive trade effects of common currency encompasses Klein (1990, 2005) and Perrson (2001). The latter work is consistent with two observations: that international trade is to a large extent controlled (if not induced) by multinational firms (see Zeile, 2003) and that evidence on exchange rate regimes on foreign direct investment is mixed (see Russ, 2007).