

Exchange Rates and Endogenous Productivity ^{*}

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Abstract

Real exchange rates (RERs) display sizable fluctuations not only over the business cycle, but also at lower frequencies, resulting in large and persistent swings over decades—facts that many business cycle models struggle to match. We propose an international macroeconomics model with endogenous productivity to rationalize these facts. In the model, endogenous growth amplifies stationary fluctuations generating persistent productivity differences between countries that trigger low-frequency cycles in the RER. The estimated model effortlessly replicates the empirical spectrum, autocorrelation, and half-life of the RER. In addition, we document that low frequency movements in aggregate trade flows are crucial to discipline the RER cycles. Finally, we validate the model-implied co-movement between relative prices and technology differentials using a panel of cross industry-country data on patent and industry prices.

1 Introduction

The excess volatility and persistence of real exchange rates (RERs) relative to other macroeconomic variables such as output and consumption has long challenged models of the international business cycle (see, for example, [Chari et al. \(2002\)](#)). Figure 1 displays the trade weighted U.S. RERs with the rest of G-7 countries. Four observations characterize the behavior of the RER. First, the detrended series display high volatility at business cycle frequencies (on average, 4.0 percent versus 1.0 percent for GDP over the same period relative to an Hodrick-Prescott (HP) trend). Second, the RER displays high serial correlation (0.96). Third, while the excess volatility is typically documented at business

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