



“Conditional PPP” and real exchange rate convergence in the euro area



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ABSTRACT

While economic theory highlights the usefulness of flexible exchange rates in promoting adjustment in international relative prices, flexible exchange rates also can be a source of destabilizing shocks. We find that when countries joining the euro currency union abandoned their national exchange rates, the adjustment of real exchange rates toward their long-run equilibrium surprisingly became faster. To investigate, we distinguish between differing rates of purchasing power parity (PPP) convergence conditional on alternative shocks, which we refer to as “conditional PPP.” We find that the loss of the exchange rate as an adjustment mechanism after the introduction of the euro was more than compensated by the elimination of the exchange rate as a source of shocks, in combination with faster adjustment in national prices. These findings support claims that flexible exchange rates are not necessary to promote long-run international relative price adjustment.

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1. Introduction

Economic theory has highlighted the ability of flexible exchange rates to promote adjustment in international relative prices towards equilibrium even when goods prices are sticky, a position famously championed in Friedman (1953). However, the foreign exchange market also can be a source of shocks, so that exchange rate flexibility may promote large and persistent deviations of the real exchange rate from long-run equilibrium. Indeed, as financial markets have become more integrated globally and international asset trade volume has grown larger compared to goods trade, nominal exchange rate fluctuations appear to be driven more by volatile financial market shocks than by pressure to balance relative goods prices.

The debate about the relative merits of exchange rate flexibility has played out prominently in arguments about the costs and benefits of joining the euro currency union, specifically whether the benefits of adopting a common currency exceed the costs of giving up the ability to promote equilibrium changes in the real exchange rate through nominal exchange rate adjustment. In contrast to Friedman’s view, several recent papers have argued that the benefits of joining a currency union exceed the costs of sacrificing exchange rate flexibility. For example, Buiter (2008) argued that the “shock absorber” role of the exchange rate is quite limited and market-determined exchange rates are primarily a source of shocks and instability, implying that joining the euro would enable the United Kingdom to escape these destabilizing effects. More recently,

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Berka et al. (2012) argued that the real exchange rate adjustment in a currency union like the euro area might be faster than under floating rates, both because exchange rates are disconnected from the foreign goods prices that consumers actually see, and because capital flows dominate nominal exchange rate movements.

This paper studies how adoption of the euro has affected the rate at which the real exchange rate of member countries adjusts to deviations from purchasing power parity (PPP).¹ In addition to providing evidence regarding how the euro has affected market integration, this investigation also provides two broader lessons regarding how to understand real exchange rate dynamics. First, we distinguish between PPP convergence conditional on alternative shocks, which we refer to as “conditional PPP.” Since we show that the half-life of real exchange rate convergence can differ significantly depending on what was the source of the real exchange rate disturbance, we argue it is important for international macroeconomists to make this distinction when characterizing the relevance of PPP as a theory of real exchange rate behavior. PPP may hold in the context of some shocks while not holding well for others, so whether PPP is a useful characterization of a given country or period depends on the mix of shocks prevalent in that sample. Second, we distinguish between the roles of the nominal exchange rate as source of shocks and as a mechanism of adjustment to shocks.

We develop a stochastic simulation-based methodology to examine these two key distinctions in characterizing real exchange rate dynamics. This methodology begins with estimating a vector error correction model (VECM) of the real exchange rate that decomposes the real exchange rate into the nominal exchange rate and the ratio of goods prices in local currency terms. This approach allows the exchange rate and prices to adjust at different speeds and also permits identification of shocks arising in the foreign exchange market separately from those in the goods market. Our exchange rate shocks could be viewed as shocks to asset preferences in an interest rate parity or portfolio preference relation, as in the framework of Flood and Rose (1999). We next estimate the half-life of the real exchange rate adjustment conditional on specific shocks, which is where “conditional PPP” comes to the fore. We then conduct counterfactual simulations of the VECM system that mix and match individual parameters characterizing the pre-euro and euro periods, particularly parameters governing long-run and short-run dynamics. Comparing half-lives across these hypothetical scenarios allows us to measure the contribution of the exchange rate as a mechanism of adjustment separately from its contribution as a source of shocks.

Our estimations allow for a linear trend in real exchange rates, following the practice of Taylor (2002) and Papell and Prodan (2006). This has been motivated theoretically in terms of Balassa-Samuelson effects of productivity differentials between traded and nontraded sectors. Given the wide belief that some European countries have experienced productivity catchup and corresponding Balassa-Samuelson effects as a result of greater integration (see Canzoneri et al., 2002; and Berka et al., 2014), allowing for a deterministic trend seems especially appropriate for this dataset.

We find that the rate at which the real exchange rate converges to its long run level became faster among European countries after they adopted the euro. This result is surprising, as we also find evidence that prior to the euro these countries indeed relied upon nominal exchange rate adjustment to correct PPP deviations, including those deviations arising specifically from shocks to domestic goods prices. This empirical evidence is consistent with popular anecdotes of countries with higher than average inflation rates using currency devaluations to correct relative price imbalances with European neighbors. Nevertheless, while the loss of this adjustment mechanism works to lengthen half-lives, we find it was more than compensated by two other factors working in the opposite direction. First, we find evidence that nominal exchange rate shocks were a substantial source of real exchange rate deviations among the countries in our sample prior to their adoption of the euro, and eliminating this source of persistent deviations under the euro lowered the average half-life of the real exchange rate. Second, we also find evidence that price adjustment in response to PPP deviations increased after the adoption of the euro. These two effects appear to have both worked to lower the half-life of the real exchange rate, and in combination they were more than enough to offset the loss of the exchange rate as an adjustment mechanism. In sum, we take these findings as support for claims that flexible exchange rates are not necessary to promote long-run international relative price adjustment.

In related literature, Cheung et al. (2004) found that the speed of PPP convergence and real exchange rate persistence for several major currencies vis-a-vis the dollar during the floating rate period is driven largely by the behavior of the nominal exchange rate, with the exchange rate responding much more slowly than prices to shocks. However, in contrast to our analysis, they do not construct orthogonalized shocks to enable measurement of the relative contributions of exchange rate and price shocks. They also did not consider the effects of monetary regime shifts, such as the adoption of the euro, on real exchange rate persistence. Parsley and Popper (2001) find faster real exchange rate convergence under currency pegs, but they do not study the case of the euro common currency. While they study in detail the nominal exchange rate as an adjustment mechanism, they do not examine the competing role of the nominal exchange rate as a source of shocks.

Several papers have investigated PPP adjustment during the euro period. Koedijk et al. (2004), Lopez and Papell (2007), and Zhou et al. (2008) conduct unit root tests of PPP, finding greater evidence of convergence for samples including the euro period. These papers, however, do not pursue explanations for this finding by estimating a VECM. In contrast to these other papers, Huang and Yang (2015) find that convergence is weaker after the introduction of the euro compared to earlier periods. While they do estimate a VECM, they do not condition by shock or use their VECM to run counterfactual simulations as we do to investigate the cause of the change in half-life.

¹ There is a large and long-standing literature estimating rates of convergence to PPP. See Imbs et al. (2005) for a prominent example and discussion of this literature.

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