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Journal of Monetary Economics 49 (2002) 913–940

Journal of  
MONETARY  
ECONOMICS

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# Exchange rate pass-through, exchange rate volatility, and exchange rate disconnect<sup>☆</sup>

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Received 16 November 2001; received in revised form 5 February 2002; accepted 8 February 2002

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## Abstract

This paper explores the hypothesis that high volatility of real and nominal exchange rates may be due to the fact that local currency pricing eliminates the pass-through from changes in exchange rates to consumer prices. Exchange rates may be highly volatile because in a sense they have little effect on macroeconomic variables. The paper shows the ingredients necessary to construct such an explanation for exchange rate volatility. In addition to the presence of local currency pricing, we need (a) incomplete international financial markets, (b) a structure of international pricing and product distribution such that wealth effects of exchange rate changes are minimized, and (c) stochastic deviations from uncovered interest rate parity. Together, it is shown that these elements can produce exchange rate volatility that is much higher than shocks to economic fundamentals, and ‘disconnected’ from the rest of the economy in the sense that the volatility of all other macroeconomic aggregates are of the same order as that of fundamentals. © 2002 Elsevier Science B.V. All rights reserved.

*JEL classification:* F3; F4

*Keywords:* Exchange rate pass-through; Exchange rate volatility; Exchange rate disconnect; Local currency pricing; Noise traders

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<sup>☆</sup>This paper was prepared for the Carnegie-Rochester Conference, Carnegie Mellon University, November 16–17, 2001. We thank Margarida Duarte and Bennett McCallum for helpful comments. Devereux thanks SSHRC for financial assistance. Engel thanks the NSF for funding.

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Empirical evidence indicates that nominal exchange rate changes are not fully passed through to goods prices. In fact, it appears that consumer prices are very unresponsive to nominal exchange rate changes.<sup>1</sup> An implication of this finding is that the “expenditure-switching” effect of exchange rate changes might be very small. That is, a change in the nominal exchange rate might not lead to much substitution between domestically produced goods and internationally produced goods, because the relative prices of those goods do not change much for final users.

If the exchange rate change has little effect on the behavior of final purchasers of goods, then it may take large changes in exchange rates to achieve equilibrium after some shock to fundamentals. For example, if there is a shock that reduces the supply of foreign goods, a very large home depreciation might be required in order to raise the relative price of foreign goods enough to reduce demand sufficiently. That is, low pass-through of exchange rates might imply high exchange rate volatility in equilibrium. That intuition was first expressed by Krugman (1989), and explored by Betts and Devereux (1996).

However, fully articulated equilibrium open-economy macroeconomic models with sticky nominal prices (in the style of Obstfeld and Rogoff (1995)) have found that exchange rate volatility is difficult to generate even when there is little exchange rate pass-through. While Obstfeld and Rogoff (1995) assume complete pass-through of exchange rates to prices because they assume that nominal prices are set in the currency of the producer, several studies have extended the Obstfeld–Rogoff framework to the local-currency pricing case.<sup>2</sup> Under local-currency pricing, firms set a price in their own currency for sale to households located in their country, but set a price in foreign currency for sales to foreign households.

The purpose of this paper is to explore the conditions under which local-currency pricing might induce a high level of exchange rate volatility. By impeding the linkage of goods prices across countries, local currency pricing leads to deviations from purchasing power parity (PPP), and therefore, in principal, may be able to explain high exchange rate volatility following the intuition of Krugman. But there are some major caveats to this conclusion. Much of the paper is devoted to understanding them. First, if international financial markets allow for full risk-sharing across countries, then exchange rates will be determined by a risk sharing condition, despite the fact that local currency prices are independent of exchange rates. Second, even if risk sharing is limited, the linkage of assets prices through bond markets will impose a tight limit on the degree to which exchange rates can move. Third, even without *any* international asset trade at all, local currency pricing does not guarantee high exchange rate volatility because wealth effects of exchange rate changes through firms’ profits will limit the degree to which the exchange rate can change. Finally, while within a particular model of local currency pricing it may be feasible to choose a parameter configuration that delivers a high level of exchange rate variability (e.g. Chari et al., 2000), this parameterization may have quite counterfactual implications for other macroeconomic variables. Our aim is not just to explain high exchange rate

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<sup>1</sup> See Engel (1993), Parsley and Wei (2001), or the references cited therein.

<sup>2</sup> See Betts and Devereux (1996, 2000) and Devereux and Engel (2000).

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