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Purchasing power parity over two centuries: strengthening the case for real exchange rate stability
A reply to Cuddington and Liang

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Abstract

Cuddington and Liang (2000) [Purchasing power parity over two centuries? Journal of International Money and Finance, 19, 751–755] examine the long span of sterling–dollar real exchange rate data of Lothian and Taylor (1996) [Real exchange rate behavior: the recent float from the perspective of the past two centuries. Journal of Political Economy, 104, 488–509] and claim to reject long-run purchasing power parity by fitting time trends or by considering very high-order autoregresssive representations. This reply demonstrates, however, that the central claims of Lothian and Taylor are in fact *strengthened* by the implications of Cuddington and Liang's analysis in that, while the economic importance of introducing trend terms is slight, this leads to a faster estimated speed of mean reversion.

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1. Introduction

We welcome the comment of Cuddington and Liang in this issue (hereafter CL) on our 1996 paper on real exchange rates as contributing to the spirit of debate

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which surrounds all worthwhile scientific endeavor. However, far from conceding that Cuddington and Liang have dealt the knock-out blow to real exchange rate stability over the past two centuries, it is clear to us that the central claims of Lothian and Taylor (1996) (hereafter LT) are in fact *strengthened* by the implications of CL's analysis.

2. Methodological issues

The central message of the CL analysis is that, in an analysis of our sterling–dollar real exchange rate data over the period 1791–1990, if very long lags are considered in the augmented Dickey–Fuller (ADF) auxiliary regressions, then the resulting ADF statistics do not enable rejection of the unit root hypothesis at the 5% significance level, while if very short lags are considered, then there are significant time trends. CL conclude that this is evidence against long-run purchasing power parity (PPP). In this section we shall briefly mention a number of methodological issues which might be raised in this context.

2.1. Implausible lag lengths

Starting from a lag length of 15 years and sequentially testing down by looking at the *t*-ratio of the coefficient of the longest lag, CL choose a lag length of 14 years for the ADF statistic and find that the unit root hypothesis cannot then be rejected at the 5% level. Since this involves 14 lags of the change in the real exchange rate, this implies an AR(15) representation for the real exchange rate. This seems to us both statistically and economically implausible.

It is statistically implausible because the sample autocorrelation and partial autocorrelation functions for the sterling–dollar real exchange reported in LT (in Fig. 4 of that paper) reveal no evidence of serial correlation beyond AR(1).[1]

It also seems economically implausible — why would any one entertain the idea of adjustment lags in real exchange rates spreading over such a long period, some 15 years? CL argue that the longer lag lengths are perhaps not implausible given the persistence in real exchange rates, citing Rogoff (1996). This does not seem to us, however, a strong argument, since one should distinguish between the amount of time taken for the full effects of a shock to be felt and the amount of time for which a shock persists. To take an extreme example, with a random walk process the full effects of a shock are felt after only one period but persist forever. With an AR(15) unit root representation seriously, however, it would take 15 years for the full effects of the real exchange rate shock to be felt, *after* which they would persist forever.

[1] One way in which a high-order autoregressive representation might arise is through the presence of moving average components, which are essentially inverted. This is not evident, however, either in the sample partial autocorrelation function (LT, Fig. 4) or from direct estimation of moving average components (LT, footnote 15, p. 495).