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Examining real interest parity: Which component reverts quickest and in which regime?

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ABSTRACT

This article re-examines real interest parity (RIP), focusing upon which component of real interest parity drives convergence to parity. We find that it is the reversion of inflation rather than nominal interest rates which is the primary source of convergence to RIP. Nominal interest rate differentials are found to be persistent during both periods. Furthermore, we additionally find that mean reversion in the inflation differentials is faster during the Gold Standard period.

1. Introduction

Real interest rate parity is one of the cornerstones of international finance. It states that real interest rates in a domestic country equal real interest rates in a foreign country. Whilst evidence in favour of this theory in this strong form is rather sparse, there is much broader support for a weaker form of the theory that states that real interest rates converge towards real interest rate parity. Nevertheless, there has been remarkably little work investigating which component of the real interest parity condition drives its longer term convergence. Chung and Crowder (2004) note that real interest rate parity is based upon four relationships holding: relative purchasing power parity, uncovered interest rate parity, the Fisher effect in the domestic country and the Fisher effect in the foreign country. Chung and Crowder (2004) provide some initial evidence on whether the four conditions for interest rate parity hold during the post-World War II sample period. They report that evidence indicates that the failure of uncovered interest parity is the dominant factor that leads to the failure of RIP.

In this paper we extend this analysis in two respects. First, we examine separately different exchange rate regimes: the Gold Standard period and the post-Bretton Woods period where floating exchange rate regimes predominate (following Dreger, 2010 for real interest parity). Second, and most importantly, we test which component is most important in driving convergence towards interest rate parity; to be specific we i) estimate the speed of mean-reversion for each component of the real parity relationship and ii) examine the extent to which the nominal interest rate differentials and inflation differentials commove with RIP. We note that the difference in real interest rates equals the nominal interest rate differential minus the inflation differential, which also equals the real interest rate in the domestic country minus the real interest rate in the foreign country. Consequently, we examine the speed of mean reversion of the inflation differential, the nominal interest rate differential, the real interest rate in the domestic country and the real interest rate in the foreign country.

2. Background — real interest parity

Real interest rate parity (RIP) in its strictest form simply states that the expected domestic real interest rate is equal to

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Table 1
Summary of literature.

Study	Period	Countries	Method + test approach	Main results
Mishkin (1981)	1953Q1–1979Q4	US	Simple regression; correlation	Rejects that the real interest rate is constant. Also finds that movements in nominal interest rates are not a reliable indicator of movements in real rates.
Mishkin (1984)	1967Q2–1979Q2	7 developed markets (US, Canada, UK, France, West Germany, Netherlands and Switzerland).	Simple regression; tests equality of real interest rates	Little support for equality of real interest rates. Suggests that this could be due to risk premiums in the forward exchange market rather than irrationality or unexploited profit opportunities.
Cumby and Obstfeld (1984)	1976M1–1981M9	6 developed markets (US, UK, Germany, Switzerland, Canada and Japan)	Simple regression; tests of homoscedastic forecast errors.	Little support for equality of real interest rates. Inflation and exchange rate forecast errors are conditionally heteroscedastic.
Mark (1985)	1973M5–1982M2	7 developed markets (US, Canada, Germany, Italy, Netherlands and UK)	Simple regression	Very little support for equality of real interest rates net of tax. Limited support for equality of real interest rates after tax.
Meese and Rogoff (1988)	1974M2–1986M3	4 developed markets (US, Germany, Japan and UK)	Simple regression; unit root test.	First, the data do not indicate a strong correspondence between real interest rate differentials (short-term or long-term) and real exchange rates.Second, some evidence of a unit root in long-term (but not short-term) real interest differentials. Thus short-term interest rates appear to converge towards RIP but not long-term interest rates.
Cavaglia (1992)	1973 M1–1987 M12	4 Developed Markets (US, Germany, Switzerland and Netherlands)	State space model with Kalman filter	Supports convergence of RIDs. Ex-ante real interest differentials for the period 1973–1987 are found to be relatively short-lived and mean-reverting to zero.
Edison and Pauls (1993)	1974Q1–1990Q4	Major developed markets (US, Japan, Germany, UK, Canada, G-10)	Unit root test; cointegration	Little evidence of mean reversion in real interest differential. The respective real exchange rates and real interest rates, and most of their constituent series, are nonstationary. Further, interest rates are not cointegrated with exchange rates.
Chinn and Frankel (1995)	1982Q3–1992Q1	Pacific Rim countries (Hong Kong, Malaysia, Taiwan, Korea, Thailand and Singapore; Japan and US base countries)	Stochastic cointegration	RIP is supported for most Pacific Rim countries. Hong Kong, Malaysia and Taiwan are linked with both the USA and Japan (in terms of cointegration and positive covariation), whilst only Singapore is solely linked with the USA. On the other hand Korea, and perhaps Indonesia and Thailand appear to be more closely linked with Japan. Real interest parity holds for only the following interest rate pairs: USA–Singapore, USA–Taiwan and Japan–Taiwan.
Kandel et al. (1996)	1984M9–1992M3	Israel	Unit root test and simple regression	Use indexed bonds and nominal bonds to infer inflation expectations. Results suggest a negative correlation between ex-ante real interest rates and expected inflation contrary to the Fisher hypothesis, which predicts a positive correlation.
Moosa and Bhatti (1997)	1980–1994	Asian economies	Test UIP and ex-ante PPP.	Find strong support for both UIP and ex-ante PPP in almost all cases.
Awad and Goodwin (1998)	1976–1994 (Weekly)	G10 countries	Cointegration	Support convergence towards RIP, especially in the long run. US appears to play a leading role.
Wu and Chen (1998)	1979M1–1996M9	Euro money market	Panel unit root	Strong evidence rejecting null of equality of real interest rates. Support for mean-reversion in RIDs.
Phylaktis (1999)	At most 1973M8–1993M9; depends on country	Pacific Basin countries	Cointegration; Impulse Response Functions (IRFs)	Support long run comovement in real interest rates. Pacific-Basin countries are also more closely linked with Japan than US.
Wu and Fountas (2000)	1974–1995	G7 against US	Cointegration allowing for endogenous structural change	Their evidence in favour of run co-movement in real interest rates both in the long-run and in the short-run. The short run results contrast sharply with the lack of RIP suggested by the traditional econometric methodology that doesn't account for structural breaks.
Holmes (2002)	1979–1998	Major European Union countries	Univariate ADF; panel unit root test	Strong evidence of "onshore RIP" during 1986–1990 and 1993–1998, but no evidence of RIP during 1990–1992. During periods where convergence towards RIP is found the estimated half-life for adjustment is rapid at 2–3 months.

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