



# Real interest parity and transaction costs for the group of 10 countries

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## Abstract

Equality of ex ante real interest rates is investigated allowing for variations within a transaction costs band. Transaction costs are estimated in foreign exchange markets and in Eurocurrency markets directly from the bid–ask spreads. Two one-sided *t* tests show that observed transaction costs are too small to account for differences among real interest rates. Moreover, there is a clear evidence that transaction costs tend to decrease overtime.

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## 1. Introduction

Many tests are used in the literature to investigate equality of ex ante real interest rates across countries. If these rates are equal, then this implies that the real interest rate is determined in the world credit market rather than in national credit markets. This means that governments are less able to conduct independent economic policies to affect the real interest rates since they are not determined by the conditions in the national markets. The empirical literature that employs regression methods to test whether two real interest rates are equal, which was led by [Cumby and Mishkin \(1986\)](#), [Mark \(1985\)](#), and [Mishkin \(1984\)](#), suffers in

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general from three measurement problems. First, it ignores new developments in time series analysis regarding the invalidity of tests when one or more of the variables are nonstationary. Second, these tests focus on the short run equality of real interest rates and ignore any dynamics and the long run validity of the real interest parity (RIP). Third, as Goodwin and Grennes (1994) argue, conventional testing of equality of real rates that uses regression methods is misleading because it ignores transaction costs. They argue further that national real interest rates may fluctuate independently within a transaction costs band, even if financial markets are well integrated. The empirical work that uses cointegration methods (for example, Chinn & Frankel, 1995; Modjtahedi, 1988; Throop, 1994) does not explicitly acknowledge this transaction costs band.

This paper goes beyond the previous literature by investigating equality among real interest rates allowing for variations within a transaction costs band. Transaction costs are estimated in foreign exchange markets and Eurocurrency markets from the bid–ask spreads. Two one-sided  $t$  tests (TOST) methodology is used to investigate whether transaction costs are large enough to account for differences among national real interest rates.

The paper is organized as follows. Section 2 describes the methods used to test for equality among ex ante real interest rates including the TOSTs. Section 3 provides a brief summary of measuring transaction costs in the literature and describes measurement of transaction costs in this paper. The empirical results are presented in Section 4, and some concluding remarks are presented in Section 5.

## 2. Methodology

Goodwin and Grennes (1994) argue that because of a transaction costs band within which real interest rates can fluctuate independently, two real interest rates  $i$  and  $j$  are effectively equal if  $|r^i - r^j| \leq t$ , where  $t$  represents transaction costs in the two markets. However, Goodwin and Grennes do not perform a formal test to account for transaction costs. They assume that the RIP condition may apply if interest rates among countries are cointegrated rather than being equal (which is a very strong condition). Therefore, they implicitly assume that transaction costs, among other things, may be accounted for by the constant term in the cointegration relations.

Here, we use the TOST methodology proposed by Lehmann (1959) and popularized by Schuirmann (1981) and Westlake (1981) in Bioequivalence testing. The intuition of the test is explained below.

Let  $\mu_1$  and  $\mu_2$  be the true means of two variables  $y_1$  and  $y_2$ . Testing the following hypothesis conventionally carries out testing for equality of these two means (Eq. (1)):

$$H_0 : \mu_1 = \mu_2 \tag{1}$$

$$\text{v.s. } H_A : \mu_1 \neq \mu_2$$

This test is inappropriate in our setting for two reasons. First, the null hypothesis states that the two means do not differ and we are interested in detecting a difference at some level

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