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# Regime linkages in the US/UK real exchange rate–real interest differential relation

Angelos Kanas\*

*Department of Economics, University of Crete,  
74100 Rethymnon, Crete, Greece*

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## Abstract

Using a multivariate regime switching framework and focusing on the period 1921–2002, which is characterized by different nominal exchange rate regimes, and monetary regimes, we find supportive evidence of the US/UK real exchange rate–real interest differential relation, in terms of volatility regime dependence. The two variables are jointly characterized by high volatility during periods of floating exchange rates, and by low volatility during periods of fixed exchange rates, thereby suggesting that the nominal exchange rate regime is the driving force behind the volatility regime switching. Thus, allowing for regime switching in the real exchange rate–real interest differential relation bridges the gap between popular theories of real exchange rate determination, which predict such a relation, and previous empirical studies, which failed to uncover such a relation for the US/UK real exchange rate.

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\* Tel.: +30 28310 77427; fax: +30 28310 77406.

E-mail address: [a-kanas@econ.soc.uoc.gr](mailto:a-kanas@econ.soc.uoc.gr)

## 1. Introduction

This paper revisits the relation between the real exchange rate and the real interest differential for the US and the UK. Although the real exchange rate–real interest differential relation is theoretically justified by popular theories of real exchange rate determination (Dornbusch, 1976; Frenkel, 1976), empirical work addressing the existence of this relation between the US and the UK is controversial: Campbell and Clarida (1987), Meese and Rogoff (1988), Clarida and Gali (1994), and Edison and Pauls (1993) rejected the hypothesis that there is such a relation for the US/UK real exchange rate, while Baxter (1994) found some positive evidence.

In the present paper, we examine whether such a relation exists by testing for stochastic regime dependence between the US/UK real exchange rate and the real interest differential for the period 1921–2002. Previous work has indicated that both the US/UK real exchange rate, and the US and the UK real interest rates are characterized by univariate stochastic regime switching in volatility (Engel and Kim, 1999; Garcia and Perron, 1996). Furthermore, Lothian and Taylor (1996), using very long time series data, have shown that the long-run level of the real exchange rate is not affected by regime switching. On the basis of these findings, in the present study, we focus on regime switching in *volatility* and not in the levels of the variables. Using a bivariate regime switching framework, we explore whether there is a linkage between the volatility regimes of the US/UK real exchange rate and the volatility regimes of the real interest differential. To put it differently, we examine whether the fact that the real exchange rate is in one volatility regime depends on the fact that the real interest differential is in the same volatility regime. We employ a Markov regime switching vector autoregression model, which captures regime switching in the bivariate relation, and find that the two variables are jointly characterized by volatility regime switching. The volatilities of the two variables appear to be jointly affected by the nominal exchange rate regime. During periods of floating exchange rates, both variables are jointly in a high volatility regime, whilst during periods of fixed exchange rates, the two variables are jointly in a low volatility regime. This finding is consistent with the results of Mussa (1986), Lothian and Taylor (2004), and Lothian and McCarthy (2002). Strong evidence is found that the regimes of the US/UK real exchange rate and the real interest differential are dependent. There is no evidence that monetary policy regime switching affects the volatility regime switching of the two variables. Our findings provide supportive evidence of a US/UK real exchange rate–real interest differential relation in terms of stochastic regime switching characterizing the behavior of the two variables, and are in line with theoretical studies which contend that nominal exchange rate regimes affect the behavior of real exchange rates and real interest differentials (Huizinga and Mishkin, 1986; Stockman, 1990; Bernanke and Gertler, 1989; Grilli and Kaminsky, 1991; Garcia and Perron, 1996; Canzoneri et al., 1997; Bernanke et al., 1999). The results suggest that allowing for volatility regime switching in the relation between the two variables bridges the gap between popular theories of real exchange rates, which support such a relation, and previous empirical results, which failed to uncover such a relation for the US/UK real exchange rate.

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