

# Does the Australian dollar real exchange rate display mean reversion

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## Abstract

This paper examines the post Bretton Woods experience of the Australian dollar. In this period Australia moved from a managed to a freely floating exchange rate environment. Parametric and non-parametric techniques are applied to data from a trade weighted index to analyse the time series properties of Australia's real exchange rate. Even allowing for structural breaks there is no evidence of the long run equilibrium relation between the exchange rate and relative prices predicted by the purchasing power parity hypothesis. © 2002 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

Great debate surrounds the question of the stationarity, or otherwise, of real exchange rates. In the case that real exchange rates are non-stationary, the principle of purchasing power parity (PPP) is no longer valid as a representation of the long run equilibrium relation between the exchange rate and relative prices. The real exchange rate measured in logarithms,  $r_t$ , may be defined as:

$$r_t = e_t - (p_t^* - p_t), \quad (1)$$

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where  $e_t$  is the logarithm of the nominal exchange rate, and  $p_t^*$  and  $p_t$  are the logarithms of the foreign and domestic price indices, respectively.

Recent empirical evidence is mixed with the PPP model being rejected in studies by (*inter alia*) Baillie and Selover (1987); Corbae and Ouliaris (1988); Taylor (1988) and Crowder (1996). However other authors argue that the observed failure of the PPP relation is due to short run deviations from the equilibrium described in (1) and that in fact PPP is valid in the long run (see Johansen and Juselius (1992); McDonald (1993); Cheung and Lai (1993); Culver and Papell (1995), and Olekalns and Wilkins (1998) *inter alia*). Similarly Papell and Theodoridis (1998) using panel unit root methods, argue that there is increasing evidence in favour of the PPP hypothesis in the post float period. However, a consensus view that real exchange rates are stationary, but highly persistent is emerging in the literature, see Froot et al. (1995); Rogoff (1996); Lothian and Taylor (1996) and Olekalns and Wilkins (1998). Engel (1998) challenges this view, arguing that the power of the unit root tests used in such studies is very low. Similarly Caner and Kilian (1998) argue that tests of the stationary null hypothesis may suffer from severe size distortions.

In this paper, we examine data for Australia's real exchange rate for evidence of non-stationarity. Since the collapse of the Bretton Woods agreement in 1973 Australian exchange rate policy has operated under two main policy regimes; a managed float until December 1983 after which the Australian dollar was allowed to float freely. Prior to September 1974 the Australian dollar was fixed against the value of the US\$. However between 1974 and 1983 the exchange rate was allowed to float in a tightly managed fashion. Initially the value of the A\$ was fixed against the value of a trade weighted basket of currencies although between November 1976 and December 1983 the link between the trade weighted index and the nominal value of the A\$ was allowed to vary. In December 1983 a floating exchange rate arrangement was introduced, allowing the value of the Australian currency to be set by market forces, although the Reserve Bank of Australia maintained the right to intervene to support the A\$. The focus of this paper is on the post Bretton Woods experience of the Australian dollar.

Most studies of PPP are based on univariate methods applied to bilateral real exchange rates, Baillie and Selover (1987); Taylor (1988) and Crowder (1996); Lothian and Taylor (1996); Caner and Kilian (1998), *inter alia*. Using panel methods applied to bilateral real exchange rates, Papell and Theodoridis (1998) and Koedijk et al. (1998), *inter alia*, find evidence for PPP post Bretton Woods. This paper departs from the norm in that we employ a real trade weighted index in which the constituent countries are selected on basis of being major trading partners with Australia. The paper aims to address some of the concerns regarding the robustness of the various tests for mean reversion by applying a range of parametric and semi-parametric techniques to the real trade weighted index sampled quarterly over the period 1973:1–1999:1. The real exchange rate series is also tested for structural change using tests that are robust to potential non-stationarity in the data. Allowing for structural breaks or regime changes is particularly important considering the nature of the post-Bretton Woods experience for Australia. The changes in exchange rate policy that have occurred give rise to the possibility of structural breaks in the data.

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