1 Are Dollar Exchange Rates Cointegrated After All?
Eric Girardin and Velayoudom Marimoutou

1.1 INTRODUCTION

Movements in the exchange rate of the dollar against the major currencies have occupied the centre stage on foreign exchange markets and in the preoccupations of specialists of international finance ever since the beginning of the floating exchange rate period. However, it is the appreciation of the dollar in the first half of the 1980s which has aroused special interest. Indeed, over such a period – even though this would go against the assumption of weak efficiency – one is tempted to search for a common trend in the exchange rates of major currencies vis-à-vis the dollar. This indeed has been the object of a lively controversy over the last few years. Baillie and Bollerslev (1989) opened the debate, using the two-step Engle–Granger technique and the more powerful Johansen test (see also chapter 4), by showing that a unique cointegrating relationship exists between the spot dollar exchange rates of the G6 currencies plus the Swiss franc over March 1980–January 1985 using daily data. However, the ‘fragility’ of such a result was evidenced by Sephton and Larsen (1991), who argued that the Johansen test exhibits a strong sensitivity to the time period on which it is based; that is, the choice of the sample period is crucial in determining the existence (or absence) of cointegration.

Along different lines, Diebold, Gardeazabal and Yilmaz (1994) questioned the existence of a cointegrating relationship between the seven spot dollar exchange rates, during the first half of the 1980s, by showing that when the possibility of drift is taken into account (which was not the case in Baillie and Bollerslev’s test) the evidence for cointegration vanishes. Baillie and Bollerslev replied in 1994. They used the Engle–Granger procedure only on the ground that in their initial work the Johansen method led them to uncover a single cointegrating vector. With this two-step procedure, they found that a long-run relationship does exist between the seven spot dollar exchange rates over the same
period. However, on the basis of the autocorrelation function, they showed that the error-correction term is characterized by the presence of long memory. They then concluded that, rather than being cointegrated, the seven spot dollar exchange rates could be characterized by a form of cointegration associated with long memory, which they dubbed ‘fractional cointegration’.

The present chapter aims to shed new light on this debate in two ways. First, it is remarkable that this controversy, which focuses exclusively on the period of dollar appreciation, neglected the period since the mid-1980s, over which the overall long-run movements of the dollar have been less unambiguous. We shall thus use a different data-set from earlier works by searching for the existence of a cointegrating relationship between the same seven spot dollar exchange rates over the period January 1986–January 1995. This will enable us to see whether the results obtained by earlier authors were the result of their focusing on a specific period of appreciation of the dollar. Further, the period we are considering is substantially longer than the one they studied. This is all the more appropriate when one looks for a cointegrating relationship. Hakkio and Rush (1991) thus advise increasing the number of observations by using the same frequency data with a longer timespan of data. Second, we systematically check that the dollar exchange rate series is not fractionally integrated (section 1.2). Such tests are necessary for us to be able to use the standard Johansen procedure for detecting cointegrating relationships. We then test whether the error-correction term obtained with this procedure is fractionally integrated, thus looking for evidence of fractional cointegration (section 1.3).

1.2 STATIONARITY TESTS


We test for stationarity successively by searching for the presence of a unit root in each of the seven exchange rate series, and by estimating the degree of differentiation of these series.