

Box 3

Determinants of the “equilibrium” value of a currency

Developments in foreign exchange markets have been characterised, particularly over the past two years, by a general tendency of the US dollar and the Japanese yen to appreciate and of the euro to depreciate markedly in nominal effective terms. These divergent exchange rate movements have given rise to concerns, as expressed in statements issued by the International Monetary Fund (IMF) and the G7, about the risks these movements pose to the world economy. In this context, the ECB has repeatedly pointed out that it considers the exchange rate of the euro at present levels to be out of line with economic fundamentals. This assessment is firmly corroborated by current empirical research on the long-run exchange rate determination conducted by international organisations, central banks and prominent academics.

There is an established and comprehensive body of literature in the field of applied economics relating to the determination of the “equilibrium” value of a currency over the long (or medium) term, which is based on a variety of theoretical and empirical concepts. The theory of purchasing power parity (PPP) – which states in its relative form that exchange rate movements reflect in the longer term the difference between the respective inflation rates – constitutes one possible starting-point for analysing the appropriateness of exchange rate movements. However, it is well known that the PPP concept has a number of shortcomings, notably: (i) it is very sensitive to the base period chosen for assessment purposes; and (ii) the adjustment speed of the exchange rate to its equilibrium path mapped out by inflation differentials is very slow, so that prolonged deviations of the exchange rate from its equilibrium cannot be explained on the basis of this concept.

Owing to these limitations, the majority of recent studies on equilibrium exchange rates rely on the macroeconomic balance approach. According to this approach, the exchange rate is influenced over the medium term by a number of real economic variables, the so-called fundamentals. In this context, one school of thought, known as the “fundamental equilibrium exchange rate (FEER) approach”, concentrates on the derivation of exchange rates that are consistent with internal and external balance.¹ An economy is said to be in internal balance if it operates at the level of output that is consistent with full employment (i.e. potential output) and price stability, while external balance corresponds to a sustainable current account position, as reflected in underlying and desired net capital flows. The FEER approach, which is a rather normative concept, allows for the equilibrium value of the exchange rate to vary over time, reflecting changes in the underlying economic fundamentals, with the variation in this value typically being very smooth and gradual.

Another related school of thought places a less normative structure on the computation of the long-term (or medium-term) path of the exchange rate. The focus in this type of study is on explaining the behaviour of exchange rates by means of relevant economic variables (the “behavioural equilibrium exchange rate (BEER) approach”).² In this context, long-term (or medium-term) movements in the real exchange rate are assumed to be explained mainly by relative sectoral productivity differentials and the outstanding stock of net foreign assets. Owing to data limitations, net foreign assets are occasionally substituted by fiscal variables, such as the ratio of government spending to GDP. Moreover, variables accounting for terms of trade shocks as well as real interest rate differentials (given the uncovered interest rate parity condition) have also been introduced as additional determinants of the real exchange rate. In this framework – and by contrast with the FEER approach – the equilibrium exchange rate is computed using the current levels of the fundamental factors, but in some studies they are also broken down into permanent and transitory components. In all of these studies, the

¹ See R. L. Driver and S. Wren-Lewis (1999), *Real Exchange Rates for the Year 2000*, Institute for International Economics; D. Borowski and C. Couharde (1999), *Compétitivité et taux de change d'équilibre de long terme*, CAE: Architecture financière internationale, Rapport du Conseil D'Analyse Economique, 18, pp. 197-204.

² See Alberola et al. (1999), *Global Equilibrium Exchange Rates: Euro, Dollar, “Ins”, “Outs”, and Other Major Currencies in a Panel Cointegration Framework*, IMF Working Paper No. 99/175; J. Hansen and W. Roeger (2000), *Estimation of Real Equilibrium Exchange Rates*, European Commission Economic Paper No. 144; J. Clostermann and B. Schnatz (2000), *The determinants of the euro-dollar exchange rate*, Discussion Paper 2/00, Economic Research Group of the Deutsche Bundesbank; R. MacDonald (2000), *Concepts to Calculate Equilibrium Exchange Rates: An Overview*, Discussion Paper 3/00, Economic Research Group of the Deutsche Bundesbank.

equilibrium exchange rate is assessed in terms of the evolution of the fundamentals in the home country, the euro area, for example, relative to that country's major competitor countries. As mentioned above, other approaches exist for evaluating the "fair" value of a currency, such as the "natural real exchange rate (NATREX)" or by means of fully specified macroeconomic models. However, these approaches are not acknowledged here, mainly because of the lack of recently published research applying these approaches to the euro exchange rate.

Overall, the studies on equilibrium exchange rates based on the macroeconomic balance approach (see footnotes 1 and 2) all point to the conclusion that the euro is significantly undervalued with regard to developments in economic fundamentals. Although great caution has to be exercised in interpreting the estimates reported as representing the equilibrium value of the euro over a long-term (or medium-term) horizon – considering the degree of uncertainty surrounding these estimates and the observed differences in the estimated equilibrium values across studies – there is currently little doubt that the euro is substantially undervalued. These results underscore the shared concerns of the G7 nations about the potential implications of recent exchange rate movements for the world economy.