Balance of payments accounting and exchange rate dynamics [☆]

Nikolas A. Müller-Plantenberg

Departamento de Análisis Económico-Teoría Económica e Historia Económica, Universidad Autónoma de Madrid, 28049 Cantoblanco, Madrid, Spain

ARTICLE INFO

ABSTRACT

The balance of payments is an accounting identity. Many wonder how the current and capital accounts, which add up to zero, can influence exchange rates. This paper shows how payment flows arising from balance of payments imbalances affect the demands for different currencies in the foreign exchange market over time. Based on a dynamical system approach, the paper demonstrates how international payments evolve depending on the joint dynamic behaviour of different balance of payments components. It finds that international payments and exchange rates interact in fundamentally different ways depending on whether a country restricts its capital inflows and outflows, whether capital flows are accommodating or autonomous and whether the exchange rate is fixed, flexible or, say, governed by a crawling peg. Empirical evidence from major industrial countries as well as from countries hit by currency crises support the paper's theoretical predictions.

"The Asians' passion for American bonds is explained by their desire to stop their currencies appreciating against the dollar. [...] The trouble is that the Asian dollar binge is putting off the inevitable adjustment to America's current-account deficit. America continues to accumulate foreign debt at an ever faster rate, so the eventual adjustment will be correspondingly bigger."
The Economist, 18 September 2003

1. Introduction

Theoretical research on exchange rates can be broadly classified into two categories. On the one hand, a great number of macroeconomic models have been developed to analyse exchange rate behaviour, including traditional monetary and portfolio balance models as well as a variety of dynamic general equilibrium models (for example emphasizing wealth effects or differences in traded and nontraded goods inflation). Macroeconomic models tend to focus on the medium and long term, yet their empirical performance has been rather disappointing on the whole (Cheung, Chinn, & García Pascual, 2005; Meese & Rogoff, 1983a,b) On the other hand, there is now a growing body of research on the microstructure of foreign exchange markets. The fundamental premise of this literature, namely that customer order flow accounts for a significant part of exchange rate changes, seems to be confirmed by the data (Lyons, 2001). However, most results are based on high-frequency data, and how FX microstructure relates to macroeconomic phenomena is far from clear.

This paper seeks to link both lines of research. It makes two main assumptions. The first assumption is that changes in exchange rates are brought about by international currency flows. The idea that changing demands and supplies in the foreign exchange

markets determine exchange rates is an old topic (Machlup, 1939, 1940; Robinson, 1937). However, the traditional flow market model has significant shortcomings as it lacks a dynamic perspective and fails to recognize the interrelatedness of the current account, the financial account and international payments. Yet the basic premise of the model–namely that international payment flows have a direct influence on exchange rates–remains as appealing as before and has regained popularity with the emergence of the literature on FX market microstructure (Vitale, 2007). Macroeconomists are now also starting to take the idea more seriously but their research has so far focused on the short-term effects of capital flows on exchange rates (Hau & Rey, 2006, 2004).

Secondly, the paper assumes that international currency flows are essentially driven by balance of payments transactions and aims to analyse the implications of the balance of payments accounting identity for the dynamics of international payment flows and exchange rates. The focus is on both the real and financial sides of the balance of payments, and in particular on their interaction over time. To this end, a dynamical system approach is developed that allows to assess how international payments evolve for different sets of assumptions regarding the joint dynamic behaviour of various balance of payments components.

Altogether, five different variants of one and the same dynamical system are analysed in the paper. First, the benchmark case of a financially closed economy is considered where current account transactions, such as exports and imports, are paid for directly in cash (model 1). In this and all following cases, it is assumed that the real exchange rate depends on the excess holdings of different currencies in the foreign exchange market. Moreover, the Marshall–Lerner condition holds and the current account is considered to adjust gradually to changes in the real exchange rate. Under these very basic and realistic assumptions, it is demonstrated how initial current account imbalances can lead to long-lasting swings in both the current account and the real exchange rate.

In the second model, current account imbalances are financed by debt, much as in the real world (model 2). Payment flows are now delayed, with the result that the impact of current account movements on the exchange rate is spread out over a longer horizon. Whereas the current account and the exchange rate still move in a cyclical fashion, the lag between both variables becomes longer. It is shown that this model represents very well the experience of the Japanese balance of payments and exchange rate over the past decades.

The third model examines the effect of temporary, autonomous capital inflows into a country (model 3). Under sensible assumptions, such inflows provoke a temporary appreciation of the currency even when the current account is strongly deteriorating. The model replicates the experience of the United States during the early 1980s and the late 1990s. In both episodes, the country was facing strong capital inflows and the US dollar appreciated massively despite burgeoning current account deficits.

In a further variation, a country with a fixed exchange rate is considered (model 4). It is shown in a simulation how temporary inflows of foreign capital can lead to a deterioration of the current account balance and a build-up of foreign claims, which eventually lead to the depletion of reserves and a breakdown of the currency. This dynamic pattern can be generated under rather simple assumptions within the dynamical system framework described above. It agrees well with anecdotal evidence from countries hit by currency crises. This is illustrated by a case study of the Korean economic performance before and during the Asian crisis of 1997–1998.

Finally, it is shown within the same framework how a crawling peg can help to avoid a currency crisis and to maintain relative exchange rate stability (model 5).

1.1. Plan of the paper

The paper is organized as follows: Section 2 introduces the common assumptions underlying the models of the following section regarding the determination of the exchange rate and of the different balance of payments components. Section 3 presents five models that show how balance of payments and exchange rate move jointly over time when different assumptions are made regarding the financial openness of a country, the nature of capital flows and the exchange rate regime. Finally, Section 4 provides conclusions.

2. Common assumptions

This section introduces the assumptions that are shared by the models of Section 3. First, the equation governing the movements of the real exchange rate is derived. Second, the equations for the different balance of payments components are specified and empirically motivated. Third, some comments are made regarding the deterministic nature of the model.

2.1. Exchange rate determination

How are exchange rates determined? The hypothesis that we adopt here is possibly the most simple and intuitive: The exchange rate is driven by the demands and supplies of currencies in the foreign exchange market, which depend on the need of foreign and domestic agents to obtain each others' currencies. Currency demands in turn are influenced by the different types of transactions that economic agents undertake. For example, exports of goods and services or sales of financial assets lead to an increase in the demand for the domestic currency and in the supply of the foreign currency in the foreign exchange market, and vice versa.

Since the foreign exchange market carries out all currency conversions resulting from countries' balance of payments transactions, its currency holdings generally do not balance to zero; in other words, the market does not clear. We assume that the price, or value, of a currency falls with the foreign exchange market's net holdings of that currency and vice versa. The exchange rate between two currencies is then given by the ratio of the two currencies' prices.