Finance Research Letters 12 (2015) 100–108

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Currency competition between the dollar and euro: Evidence from exchange rate behaviors

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ARTICLE INFO

Article history:
Received 14 September 2014
Accepted 18 November 2014
Available online 27 November 2014

JEL classification:
F31
F36
G11
G15

Keywords:
Currency competition
Dollar
Euro
Exchange rates
Exchange risk

ABSTRACT

Using a simple numeraire currency-independent metric to measure distances between currencies, it is found that for most of the 25 sampled floating currencies, excluding the US dollar and euro, there has been a noticeable decrease in the ratio of a currency's distance from the euro to its distance from the dollar during the period from 1999 to 2013. Evidence that exchange risk has increased substantially is also found for dollar-based agents, while it has decreased for euro-based agents. Overall, the findings indicate that the influence of the euro, relative to the dollar, on other currencies has increased since its introduction.

1. Introduction

The two key motives for the adoption of the euro were to enhance the role of Europe in the world monetary system and to turn the European Union into a truly unified market (Krugman et al., 2012). In relation to the second motive, a number of prior studies have examined the question of whether the euro has actually contributed to the integration of the European market (see, for example, Rose, 2000;

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http://dx.doi.org/10.1016/j.frl.2014.11.003
1544-6123/

Rose and van Wincoop, 2001; Micco et al., 2003; Engel and Rogers, 2004; Dominguez, 2006; Lane, 2006; Abad, 2009; European Central Bank, 2013, 2014). In relation to the first motive, however, there is little evidence regarding the extent to which the euro (EUR), relative to the US dollar (USD), has influenced the exchange rate behaviors of other currencies. There have been numerous studies that have examined such questions as how the world monetary system will evolve over time and whether the euro will surpass the dollar as the leading vehicle currency (see, for example, Fratianni and Hauskrecht, 1998; Portes and Rey, 1998; Mundell, 2000; Bergsten, 2002; Kenen, 2002; Chinn and Frankel, 2005; Eichengreen, 2005; Cohen, 2007; Norrlof, 2009, 2014; Pisani-Ferry and Posen, 2009; Fields and Vernengo, 2013). However, most of these studies have focused on power analyses of the dollar against the euro with regard to the reserve position of the two currencies in the central bank holdings and to the use of the two currencies in international transactions.

The objective of this paper is to examine the currency competition between the dollar and euro by directly focusing on the influence of the dollar and euro on the exchange rate behaviors of other currencies and by examining how their relative influence has evolved during the period since the introduction of the euro (1999–2013). In doing so, we introduce a simple distance metric that is independent of the choice of the numeraire currency in expressing bilateral exchange rates. Using this distance metric, we first examine the temporal variation of the natural logarithm value of the ratio of a currency's distance from the euro to its distance from the dollar, hereafter called the *currency distance ratio*. For a given currency, if the influence of the euro relative to that of the dollar on this currency increases over time, the movement of the currency will more closely track the movement of the euro than that of the dollar; thus, the currency distance ratio will decrease over time.[1] We next examine the temporal variation of foreign exchange risk for dollar-based and euro-based agents. If the influence of the euro relative to the dollar on other currencies increases over time, the exchange risk is likely to increase for dollar-based agents and decrease for euro-based agents.

The results from the sample period of 1999–2013 indicate that, for most of the 25 floating currencies sampled, excluding USD and EUR, there has been a noticeable decrease in the currency distance ratio. Furthermore, the finding remained robust when subjected to several sensitivity tests. In particular, the influences of other major currencies, such as JPY, GBP, and CHF, relative to the USD on lesser currencies are demonstrated to be significantly less than that of EUR. Next, the results for the temporal variation of exchange risk indicate that the exchange risk increased substantially for dollar-based agents, while it decreased somewhat for euro-based agents, over two equal sub-periods. Taken together, our findings indicate that the influence of the euro relative to the dollar on the exchange rate behaviors of other currencies has increased over time.

In Sections 2 and 3 of this paper, we discuss the data and methodology, respectively. In Section 4, we present our key empirical results; Section 5 presents our conclusions.

2. Data

Our sample spans the 15-year period from January 1, 1999 (Friday) to December 27, 2013 (Friday), and it includes 27 currencies: those of Australia, Brazil, Canada, Chile, Colombia, Czech Republic, Euro area, India, Indonesia, Israel, Japan, Korea (South), Malaysia, Mexico, New Zealand, Norway, Philippines, Poland, Russian Federation, Singapore, South Africa, Sweden, Switzerland, Thailand, Turkey, United Kingdom, and United States.

We selected the sample currencies based on the following procedure. First, we started with the 33 currencies that are consistently ranked in the top 35 in terms of their foreign exchange (FX) turnover share according to Triennial Central Bank Survey reports from April 2001, 2004, 2007, 2010, and 2013 of the Bank for International Settlements (BIS).[2] On average, the 33 currencies selected comprise 97.3% of the total FX turnover. Next, we examined the history of the exchange rate arrangements and monetary policy frameworks conducted annually by the International Monetary Fund (IMF) in order to only focus

[1] In Section 3, we provide a more formal reasoning using a bipolar model as an approximation for the world monetary system.

[2] We consulted various issues in the "Triennial Central Bank Survey: Foreign Exchange and Derivatives Market Activity" published by the BIS. The survey reports the ranking of currencies up to the 35th rank, based on the FX turnover share.