Unconventional monetary policy and the 'currency wars'

By

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Abstract

Employing a panel of exchange rates and a difference-in-difference methodology, we find that unconventional monetary policy (UMP) resulted in an increase in exchange rate volatility and weaker exchange rates in UMP-adopter countries relative to others.

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1. Introduction

In the 2000s, several central banks experimented with unconventional monetary policies (UMP) aimed at boosting nominal spending. UMP-adopters have been accused of seeking to depreciate their exchange rates to gain a competitive advantage in international trade. For example, Brazilian Finance Minister Guido Mantega stated, "We're in the midst of an international currency war, a general weakening of currency. This threatens us because it takes away our competitiveness... (Financial Times, September 27, 2010)." We shed light on the 'currency war' accusation by examining whether the adoption of UMP was associated with different exchange rate behavior in adopter countries relative to others. The large amount of empirical work on the impact of UMP has focused mainly on the effects on interest rates and bond yields of large scale asset purchases by central banks (see Gagnon, 2016, for a survey). Studies of exchange rate effects of UMP relate mainly to the impact of negative policy interest rates (NPIR) introduced by several central banks from 2012 (e.g., Molyneux et al., 2017; Arteta et al., 2016; Ball et al., 2016; Jobst and Lin, 2016; Hameed and Rose, 2016). In general, these studies focus on the average impact on exchange rates and suggest few if any important effects; our approach focuses on UMP more generally and on its "differential effect" on the exchange rates of adopter and non-adopter countries.

2. Methodology and data

Our baseline differences-in-differences specification takes the following form:

$$FE_{it} = \alpha + \beta_1 T_i + \beta_2 Post_t + \beta_3 (T_i * Post_t) + \delta X_{it} + \delta_i + \varphi_t + \varepsilon_{it} \quad (1)$$

where FX_t is the exchange rate variable in country *i* at time *t*, T_i is a dummy variable equal to 1 if the country is an UMP-adopter and 0 otherwise, and captures possible differences between the UMP-adopters and non-adopters prior to the policy change; $Post_t$ is a dummy variable equal to 1 in the post-UMP adoption period in both UMP-adopter and non-adopter countries and captures aggregate factors that would cause changes in exchange rate behavior in the absence of a policy change; $(T_t * Post_t)$ is the difference-in-difference estimator that captures the average difference in exchange rate behavior between UMP-adopters and non-adopters; X_{it} is a vector of controls that includes exchange rate regime flexibility and whether a country has adopted an inflation targeting regime. We also include δ_i and φ_t, to capture country and year fixed effects. FX_t is represented alternately by the volatility of the bilateral exchange rate, the (log) level of the bilateral exchange rate, the volatility of the nominal effective exchange rate, and the (log) level of the nominal and real effective exchange rate.

The data panel comprises 26 countries plus the eurozone, includes five UMP-adopter central banks, and spans January 2000 to December 2016. Data on bilateral and effective exchange rates are from central bank websites and the Bank for International Settlements. The volatility of effective exchange rates is measured by the standard deviation of the daily percent change and the dollar is the base currency for the analysis of bilateral rates. The exchange rate regime is the "coarse" classification devised by Reinhart and Rogoff (2004), updated through 2016 by Ilzetzki et al. (2017ab). Inflation targeting countries are from Hammond (2012). Table 1 provides the dates of the start of major asset purchase periods by the UMP-adopters. Except for Japan, these started from late 2008, and in our baseline we employ a common start date of January 2009.

3. Empirical results

Table 2 reports baseline estimates with and without controls. The results for th e bilateral exchange rates in Panel A of the table suggest no difference in exchange rate volatility between UMP-adopters and non-adopters but that UMP adoption was associated with a depreciation in the level of the bilateral exchange rate relative to the currencies of non-adopters—i.e., the coefficient on (*T*Post*) is negative and statistically significant, with the average treatment effect equivalent to an 11-13% relative depreciation. The coefficients on (*T*Post*) for the nominal effective exchange rate reported in Panel B indicate that UMP-adopters had more volatile effective exchange rates (3-5%) than non-adopters, and that UMP adoption also depreciated the nominal effective exchange rate relative to that of non-adopters (by 1-3%). The results in panel C show that UMP-adopters experienced a depreciation in the level of the real effective exchange rate (by 17-18%) relative to non-adopters. Accordingly, our baseline results offer some support to the 'currency wars' accusers by suggesting that UMP was associated with greater depreciation of bilateral and effective exchanges in adopter countries. The coefficients on the control variables suggest that a more flexible exchange rate regime and inflation targeting are associated with greater exchange rate volatility.

We employ three robustness tests. First, we exclude Japan from the sample because of its much earlier adoption of UMP. These results are reported in Panel A of Table 3. The conclusions do not change: UMP adoption is associated with greater volatility of bilateral and nominal effective exchange rates, and a depreciation of the bilateral and effective exchange rates relative to non-adoption. Second, we control for a misidentification of the start date of UMP by shifting the date to 2007. These results are reported in Panel B and show that the volatility of the nominal effective exchange rate was greater for UMP-adopters and that their bilateral, nominal and real effective exchange rates depreciated relative to those of non-adopters. Finally, in Panel C we report estimates for euro-based bilateral exchange rate volatility and exchange rate levels to ensure that the currency base did not distort the results. These results also suggest that UMP was associated with greater relative volatility and depreciation of the bilateral exchange rate though in the latter case the coefficient on ($T*P$) is significant at only the 10% level.

4. Conclusions

We asked whether the adoption of UMP by several countries resulted in a different behavior of their exchange rates relative to those of countries that did not adopt UMP. Our results, which appear reasonably robust, suggest that the effective exchange rates of UMP-adopters were generally more volatile, and that the levels of their bilateral, nominal and real effective exchange rates depreciated, relative to non-adopters. Accordingly, we view our results give some support to those accusing UMP-adopters of having engaged in a 'currency war', whether by design or accident.

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Table 1. Start dates for unconventional monetary policies[1]

Country/central bank	Start date
European Central Bank	May 2009; January 2015; March 2016
Japan	March 2001; October 2010; August 2011; October 2011; April 2013; October 2014
Sweden	February 2015
United Kingdom	March 2009; November 2009; October 2011; February 2002; July 2012; August 2016
United States	November 2008; November 2010; December 2012

Sources: Central bank websites.
1 Defined as the start of periods of large-scale asset purchases as stated by the different central banks.

Table 2. Baseline estimate: Unconventional monetary policy and exchange rates

A. Bilateral exchange rate versus US dollar

	Volatility		Level	
Post	0.007	0.055***	-0.029	-0.114
	(0.033)	(0.016)	(0.018)	(0.020)
Treat	-0.047***	-0.104***	-0.999***	-1.665***
	(0.012)	(0.017)	(0.007)	(0.202)
Post*Treat	0.014	0.040	-0.134***	-0.112***
	(0.017)	(0.032)	(0.013)	(0.007)
Exchange rate regime		0.163***		-0.591**
		(0.028)		(0.261)
Inflation targeter		0.047		1.181***
		(0.041)		(0.183)
Intercept	0.654***	0.146***	2.632***	3.505***
	(0.026)	(0.046)	(0.010)	(0.653)
R^2	0.001	0.081	0.030	0.150
Observations	5299	4767	5280	5076

B. Nominal effective exchange rate

	Volatility		Level	
Post	0.015	0.036***	-0.033	-0.007***
	(0.024)	(0.012)	(0.046)	(0.001)
Treat	-0.113***	-0.256***	0.045	0.099***
	(0.010)	(0.018)	(0.070)	(0.028)
Post*Treat	0.033**	0.053***	0.014	-0.032***
	(0.014)	(0.018)	(0.065)	(0.001)
Exchange rate regime		0.156***		-0.004
		(0.014)		(0.026)
Inflation targeter		0.079***		-0.045
		(0.019)		(0.050)
Intercept	0.495***	-0.011	4.583***	4.615***
	(0.018)	(0.023)	(0.034)	(0.038)
R^2	0.011	0.147	0.022	0.054
Observations	5508	4969	5508	5304

C. Real effective exchange rate

			Level	
Post			0.066***	0.091***
			(0.007)	(0.001)
Treat			0.190***	0.267***
			(0.008)	(0.002)
Post*Treat			-0.173***	-0.181***
			(0.009)	(0.001)
Exchange rate regime				0.034***
				(0.005)
Inflation targeter				0.016
				(0.014)
Intercept			4.502***	4.563***
			(0.005)	(0.024)
R^2			0.158	0.237
Observations			5508	5304

Robust standard errors in parenthesis. *** and ** indicate statistical significance at the 1% and 5% levels, respectively.

Table 3. Robustness tests: excluding Japan; changing UMP start date; and bilateral rate versus the euro

	Bilateral exchange rate		Nominal effective exchange rate		Real effective exchange rate
	Volatility	Level	Volatility	Level	Level
A. Treatment group excludes Japan					
Post	-0.018	-0.062***	0.004	-0.030***	0.067***
	(0.016)	(0.000)	(0.024)	(0.010)	(0.001)
Treat	-0.116***	-1.683***	-0.256***	0.087***	0.237***
	(0.025)	(0.049)	(0.019)	(0.027)	(0.002)
Post*Treat	0.071**	-0.098***	0.049***	-0.014***	-0.164***
	(0.034)	(0.000)	(0.015)	(0.001)	(0.001)
Exchange rate regime	0.163***	0.593*	0.154***	-0.004	0.033***
	(0.028)	(0.084)	(0.012)	(0.026)	(0.003)
Inflation targeter	0.053	1.178**	0.087***	-0.044	0.018
	(0.041)	(0.076)	(0.018)	(0.049)	(0.024)
Intercept	0.182***	3.474***	0.010	4.625***	4.580***
	(0.047)	(0.181)	(0.022)	(0.037)	(0.024)
R^2	0.078	0.150	0.145	0.061	0.202
Observations	4767	5076	5304	5304	5304
B. UMP begins 2007					
Post	0.055**	-0.114***	0.036***	-0.007***	0.091***
	(0.016)	(0.020)	(0.012)	(0.001)	(0.001)
Treat	-0.104***	-1.665***	-0.256***	0.099***	0.267***
	(0.017)	(0.202)	(0.018)	(0.028)	(0.002)
Post*Treat	0.040	-0.112***	0.053***	-0.032***	-0.181***
	(0.032)	(0.007)	(0.018)	(0.001)	(0.001)
Exchange rate regime	0.163***	-0.591**	0.156***	-0.004	0.034***
	(0.028)	(0.261)	(0.014)	(0.026)	(0.005)
Inflation targeter	0.047	1.181***	0.079***	-0.045	0.016
	(0.041)	(0.183)	(0.019)	(0.050)	(0.014)
Intercept	0.146***	3.505	-0.011	4.615***	4.563***
	(0.046)	(0.653)	(0.023)	(0.038)	(0.024)
R^2	0.081	0.150	0.147	0.054	0.237
Observations	4767	5076	4969	5304	5304
C Bilateral exchange rate versus euro					
Post	0.060*	-0.030			
	(0.031)	(0.030)			
Treat	-0.142***	-0.717			
	(0.025)	(0.615)			
Post*Treat	0.052***	-0.058*			
	(0.020)	(0.030)			
Exchange rate regime	0.175***	-0.206			
	(0.018)	(0.574)			
Inflation targeter	0.068***	0.436			
	(0.022)	(1.104)			
Intercept	0.099***	3.025***			
	(0.030)	(0.840)			
R^2	0.081	0.034			
Observations	4767	5280			

Robust standard errors in parenthesis. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Appendix Table. Unconventional monetary policy (UMP) adopters and non-adopters in the country sample

UMP-adopters (treatment group):

European central bank (eurozone countries), Japan, Sweden, United Kingdom, United States

Non-adopters (control group):

Australia, Brazil, Canada, Chile, Colombia, China, Croatia, Czech Republic, Denmark, Hungary, India, Israel, Korea, Mexico, New Zealand, Norway, Poland, Russia, South Africa, Switzerland, Thailand, Turkey