



No. 23-2008

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This version: 21 September 2011

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* Thanks to Roland Füss, participants of the Money, Macro and Finance Group Annual Conference in Limassol, 8th Workshop on Money, Banking, and Financial Markets in Halle, and MAGKS research seminar in Rauschholzhausen for their helpful comments on earlier versions of the paper. Of course, all remaining errors are our own.

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Abstract

Using a GARCH model, we study the effects of U.S. monetary policy and U.S. macroeconomic announcements on Argentine money, stock, and foreign exchange markets over the period January 1998 to July 2007. We show, first, that both types of news have a significant impact on all markets. Second, there are noticeable differences in the reaction during different subsamples: Argentine money markets were more dependent on U.S. news under the currency board than after its abandonment. Finally, we find that U.S.-dollar-denominated assets react less to U.S. news than peso-denominated, which suggests that the currency board was not completely credible during its final years.

JEL: E52, F33, G14, G15

Keywords: Argentina, Financial Markets, Monetary Policy, Federal Reserve Bank, Central Bank Communication, Macroeconomic Announcements

1. Introduction

The impact of central bank communication and macroeconomic announcements on financial markets in the United States has been studied extensively. Concentrating on the formal and informal channels of central bank communication, many papers find that U.S. financial markets react to this news (for instance, Ehrmann and Fratzscher, 2007; Hayo et al., 2008). However, given that the United States is the world's largest economy, it is likely that its economic news matters for other countries, too. There are several channels through which foreign macroeconomic shocks are transmitted to financial markets: The first channel is based on greater real economic integration via international trade.¹ An economic upswing in a closely integrated foreign country is bound to improve the domestic situation through increased imports and vice versa. The second channel is financial market integration based on high capital mobility. This channel carries the risk of contagion arising from shocks in other markets. The third channel is driven by monetary policy: Argentina pegged its exchange rate against the U.S. dollar and, therefore, had to follow U.S. monetary policy very closely. This also implies a greater sensitivity to U.S. news and a co-movement of short term interest rates.

As a case study of an emerging financial market, Argentina is of particular interest. Given that it had a fixed exchange rate regime until February 2002, we expect U.S. developments to have a substantial impact on the Argentine economy.² Studying this period of recent Argentine economic history also allows an analysis of how financial markets in Argentina react to U.S. news after entering the new regime of flexible exchange rates with the U.S. dollar. Our analysis focuses on the influence of U.S. news on Argentine markets during “normal” times.³ Thus, it leaves out both the Argentine financial crisis, a period where domestic problems lead to the breakdown of the currency board, and the recent financial crisis.⁴ Contrasting currency board regime and floating exchange rate regime, we address three specific research questions: *First, do U.S. central bank communication and U.S. macroeconomic announcements exert any influence on Argentine financial market returns? Second, does the creation of the currency board affect the strength of this effect? Third, was the currency board credible during its final years?*

The remainder of the paper is organized as follows. In the next section, we summarize the previous work in this area and outline the contributions of this paper. Section 3 describes

¹ The trade share of Argentina with the U.S. is between 10 and 16 percent and declines during the sample period.

² Wolf et al. (2008) provide a comprehensive overview on the technical functioning of currency boards and the macroeconomic challenges faced by countries that peg their exchange rate.

³ Further information on the sample period is provided in section 3.

⁴ The Argentine currency board and its breakdown are discussed, for instance, in Bleaney (2004) and Gurtner (2004).

the construction of the news dummies and explains our data set as well as the econometric methodology. Section 4 reports our empirical results for the money, stock, and foreign exchange markets. Section 5 concludes.

2. Related literature and our contribution

There is a large branch in the literature analysing the impact of macroeconomic announcement on financial markets (for instance, Bollerslev et al., 2000) or the co-movements of international financial markets (for instance, Forbes and Rigobon, 2002). However, to our knowledge, there are only very few papers that study spillover effects of either *U.S. monetary policy* or *U.S. macroeconomic announcements* on emerging markets. Wongswan (2009) analyzes the response of global equity indices to *U.S. monetary policy announcements*. Using intraday data, he finds that the *Argentine Merval Index* falls significantly, by 6 percentage points, after a surprise hike of 100 bps. However, when excluding intermeeting target rate moves, the coefficient becomes insignificant. Also employing intraday data, Robitaille and Roush (2006) examine the reaction of *Brazilian sovereign yield spreads* and *stock prices* to *FOMC announcements* and *U.S. macroeconomic surprises*. They find that announcements of a U.S. interest rate hike lead to an increase in bond spreads and a decline in the Bovespa index. Nonfarm payroll news as well as CPI surprises tend to raise spreads and cause a fall in share prices. Wongswan (2006) analyzes the transmission of *U.S. macroeconomic announcements* and *interest rate decisions* on financial markets in developing countries. Using high-frequency data, he concludes that a large and significant association exists between news originating in the United States and volatility, as well as trading volumes, in the Korean and Thai equity indices.

Andritzky et al. (2007) investigate the reaction of *emerging market bonds* to *U.S. macroeconomic announcements* and *target rate changes*. Global bond spreads tend to respond more to rating actions and changes in U.S. rates than to the respective domestic news. U.S. macroeconomic data and policy announcements reduce uncertainty and stabilize spreads. Arora and Cerisola (2001) explore how *sovereign bond spreads* are influenced by *U.S. monetary policy*. They conclude that the stance and predictability of U.S. monetary policy are important for stabilizing capital flows and capital market conditions in emerging markets. Alper (2006) concludes that the *unanticipated component of U.S. monetary policy* is significant in explaining movements in *emerging market sovereign bond spreads*.

In this paper, we study the effects of Federal Reserve (Fed) communications (including target rate movements) and U.S. macroeconomic announcements on money, stock,

and foreign exchange market returns in Argentina. The inclusion of U.S. news (besides U.S. financial market returns) allows us to explore one of the sources of financial market co-movements. Our sample time period (January 1998–July 2007) is particularly useful in this regard as it includes the switch in the Argentine exchange rate regime. Econometrically, we employ a GARCH specification of daily financial returns to capture the autoregressive conditional heteroscedasticity that characterizes many financial series. Our approach extends the existing literature in two ways. First, ours is a pioneering study of the effects of formal and informal communication by the Fed on Argentine financial markets. We employ a data set containing indicators based on speeches by Fed officials on the topics of monetary policy inclination and economic outlook. Previously, only actual target rate changes by the Fed have been studied. Second, this is the first paper to examine the different Argentine exchange rate regimes in this context.

3. Data and econometric methodology

In our analysis, we use the data set introduced and extensively described in Hayo et al. (2008) and extend it until July 2007. It includes summaries of 705 speeches and 159 congressional hearings, covering all members of the Board of Governors, as well as 72 postmeeting statements and 22 monetary policy reports (MPR). The communication events are subjectively coded into dummy variables on the basis of their written content.⁵ Following the literature (for instance, Ehrmann and Fratzscher, 2007), we categorize the communication content into a monetary policy and an economic outlook component. The coding for the U.S. economic outlook news is either “positive” (EO+) or “negative” (EO–), while “tightening” (MP+) or “easing” (MP–) are the categories for the Fed’s monetary policy stance. In the analysis, we employ dummy variables that are split into positive and negative news to take into account possible asymmetric reactions of financial markets.⁶ In total, there are 16 communication dummies as all four types (statements, MPR, testimony, speeches) can be

⁵ In designing these categories of news, we carefully read the speeches twice, with a considerable time lag between each reading, and then coded them independently into the respective dummy categories. In the case of a conflict between the two gradings, we checked the relevant speeches yet another time and adjusted our indicators accordingly. We employed extensive robustness checks to ensure that our results do not depend on the particular coding of ambiguous individual observations. Data are obtained from the official website of the Board of the Governors of the Federal Reserve System.

An alternative to subjective coding is using content analysis software (for instance, Lucca and Trebbi, 2009). However, communications other than postmeeting statements are not standardised and, thus, content analysis programmes fail to detect systematic patterns in these more complex texts.

⁶ Evidence of this type of asymmetries can, for instance, be found in the impact of IMF statements on financial returns in emerging markets (Hayo and Kutan, 2005) or in the effects of FOMC communication on U.S. financial market returns (Hayo et al., 2008).

coded into the four different categories EO+, EO−, MP+, and MP−. Communication events after market closure are assigned to the next business day.

The surprise components of several macroeconomic indicators typically watched by financial market participants are also subject to examination. We choose the same 10 news items as Ehrmann and Fratzscher (2007): advance gross domestic product (GDP), industrial production, and trade balance to capture the growth expectations; the Institute for Supply Management (ISM) survey and the Conference Board consumer confidence for producer and consumer confidence; nonfarm payroll and the unemployment rate to proxy labour market conditions; retail sales for actual consumption; the consumer price index (CPI) and producer price index (PPI) for inflation. These variables enter Equation (1) separated into positive and negative impulse dummies on the day of their announcement.⁷

Our Argentine financial market indicators are comprised of daily closing interbank lending rates and daily returns on stock and foreign exchange markets over the period from January 2, 1998 to July 31, 2007.⁸ As dependent variables, we employ (i) daily changes of the three-month Buenos Aires Interbank Offered Rate. Until the abandonment of the currency board, we examine both peso- and dollar-denominated interbank rates. We also assess (ii) the daily growth rates of the Merval Stock Index and (iii) the dollar/peso spot rate.⁹ We split the sample into two subsamples: the first ends on June 29, 2001 and is called the currency board subsample.¹⁰ The floating exchange rate subsample starts on January 2, 2003 and continues until the end of our sample window.¹¹

Descriptive statistics show that all financial market series exhibit excess kurtosis (Tables A1–A2 in the Appendix). ARCH models increase estimation efficiency in time series characterized by volatility clustering (Engle, 1982). We start with a generalized version of the

⁷ We explored several specifications for U.S. macroeconomic news. In a first step, we test whether the actual values, the standardized shocks, or both have an impact on our financial market indicators. The shocks are significant, whereas the actual values remain insignificant. The same outcome occurs when including actual values and news dummies instead of shocks. In a second step, we discover that the results using news dummies weakly dominate the ones using standardised shocks in terms of significance and, therefore, we employ news dummies in the analysis presented below.

⁸ Data sources: U.S. bond market and foreign exchange market series—Federal Reserve’s statistical releases H10 and H15; stock market series—Yahoo! Finance database; Argentine interbank lending rates—Central Bank of Argentina statistical database; Surveys of macroeconomic announcements—Bloomberg newswire.

⁹ Exchange rates are defined in price notation, which implies that an increase in the exchange rate indicates an depreciation of the peso against the dollar. It is used as an endogenous variable only in the second subsample, as it was pegged until February 2002.

¹⁰ In July 2001, the Argentine economic and financial crisis hit the money market as returns increased sharply. Markets displayed lack of confidence in the government’s plan to balance the budget and subsequently the country rating worsened.

¹¹ In December 2002, the financial crisis’ effects on money markets decreased clearly after restrictions on peso-denominated bank withdrawals are relaxed and the government showed its “good faith” with symbolically repaying some debt to several international organisations.

GARCH specification proposed by Bollerslev (1986) and apply a testing-down process to increase estimation efficiency:

$$(1) \text{ returns}_t = \gamma + \delta \text{ returns}_{t-1} + \zeta \text{ financial control variables}_{t-1} \\ + \eta \text{ day of the week effects} + \theta \text{ target rate movements} \\ + \iota \text{ U.S. macroeconomic announcements} \\ + \lambda \text{ U.S. communication dummies} + \mu_t,$$

$$\mu_t = \epsilon_t h_t^{1/2},$$

$$h_t = \alpha_0 + \alpha_1 \mu_{t-1}^2 + \beta_1 h_{t-1},$$

where α_0 , α_1 , β_1 , μ , γ , δ , ζ , η , θ , ι , λ , and v are parameters or vectors of parameters and $\epsilon_t | \Gamma_{t-1} = t(v)$; with Γ_{t-1} capturing all information up to $t-1$, and $t(v)$ a t -distribution with v degrees of freedom (Bollerslev, 1987). Contemporaneous financial control returns (returns on other Argentine markets, U.S. bond and stock returns, and growth rates of the EMBIG Latin spread) are excluded to avoid potential simultaneity problems. We also control for day of the week effects and movements in the Federal Funds Target Rate by including separate dummies for expected and unexpected rate hikes and cuts.¹² After estimating these rich GARCH(1,1) models, we exclude all insignificant variables in a general-to-specific approach.

4. Analyzing the effects of Fed communication on financial market returns

Table 1 shows the impact of U.S. news on money market returns (Buenos Aires Interbank Offered Rate, Baibor) and on the main equity market index (Merval) during the currency board era. U.S. target rate changes are particularly important when they surprise the markets. Both, peso- and dollar-denominated money market rates, increase after a 25 bps surprise hike, whereas such news depresses equity returns.¹³ Unexpectedly loose monetary policy also influences all three markets. The hike in equity returns is the largest reaction found across all news and assets.¹⁴ Finally, expected target rate cuts decrease peso-denominated returns.

¹² Bloomberg surveys are used to identify surprises from scheduled meetings. Intermeeting moves are naturally classified as surprises.

¹³ The coefficients can be interpreted as follows. All target rate variables are coded as multiples of 25 bps. For instance, the coefficient 0.198 (−0.801) implies an increase of 19.8 bps (decrease of 80.1 bps) of the 3-month peso rates (the Merval index) after a surprise hike in the U.S. target rate. In the case of macroeconomic surprises and central bank communication, we rely on news dummies. For instance, the coefficient 0.055 (−2.262) denotes an increase of 5.5 bps (decrease of 2.26 pp) of the 3-month peso rates (the Merval index) after the announcement of a higher than expected U.S. CPI.

¹⁴ The influence is statistically larger than for target rate hike surprises ($\text{Chi}^2(1) = 4.2^*$). Note, that the influence on money market returns is counterintuitive.

Macroeconomic news is only important for peso-denominated and equity returns; dollar-denominated returns are unaffected by this news category. A higher than expected CPI significantly moves the money market returns up, an indication of the Fisher relationship, and the stock market down. We also observe falling money market rates after lower than expected CPI¹⁵ and GDP figures. Central bank communication is particularly important when it conveys negative news about the economic outlook: Speeches (postmeeting statements) decrease peso-denominated (dollar-denominated) returns as do MPR or congressional hearings on the equity market.

Table 1: Results for Currency Board Subsample (January 1998–June 2001)

	3-Month Peso	3-Month Dollar	Merval
α_0	0.001 *	0.000	0.232 *
α_1	0.441	0.285	0.090 **
β_1	0.559 **	0.715 **	0.872 **
Student-t dof	3.202 **	2.812 **	3.989 **
Endogenous 1st Lag	0.437 **	0.256 **	
EMBIG Latin 1st Lag	-0.020 **		
TR Surprise Hike	0.198 **	0.136 *	-0.801 **
TR Cut	-0.037 *		
TR Surprise Cut	0.088 *	0.105 **	3.272 **
CPI +	0.055 **		-2.262 **
CPI -	-0.040 **		
GDP -	-0.096 **		
Statement MP +			-0.647
Statement EO -		-0.150 *	
MPR/Testimony EO -			-1.174 **
Speech MP +			-0.750
Speech EO -	-0.044 *		
Exclusion Restriction	48.6	16.8	51.2
ARCH 1-2 Test	0.002	0.017	0.105

Notes: * (**) indicates significance at a 5% (1%) level. Standard errors are heteroscedasticity-consistent (Bollerslev and Wooldridge, 1992). Number of observations: 839.

The results for the floating exchange rate subsample are given in Table 2. Neither U.S. macroeconomic news nor target rate movements have any significant impact on money market rates. A U.S. target rate cut depresses equity returns—a finding which is not consistent with our priors—but expectedly appreciates the peso against the dollar. A relatively higher Argentine rate then triggers additional capital imports, which lead to an appreciation of the exchange rate. Positive ISM news increase equity returns, whereas a lower than expected CPI

¹⁵ The influence of positive and negative CPI news is statistically equal ($\text{Chi}^2(1) = 0.43$).

and negative nonfarm payroll as well as retail sales news appreciate the peso against the dollar.

Central bank communication is relevant for all markets: a negative economic outlook put forward in a MPR or a testimony decreases money markets returns as does the indication of a future target rate cut provided in a speech. The exchange rate appreciates after the consideration of an interest rate cut in a MPR, testimony or a speech. Finally, equity returns increase after a dovish MPR/testimony or a bright economic outlook presented in a speech.

Table 2: Results for Floating Exchange Rate Subsample (January 2002–July 2007)

	3-Month Peso	Merval	ARS/USD
α_0	0.001 **	0.105 *	0.001 **
α_1	0.308	0.091 **	0.245 **
β_1	0.692 **	0.876 **	0.755 **
Student-t dof		6.171 **	9.268 **
EMBIG Latin 1st Lag			-0.065 **
ARS/USD 1st Lag	0.068 *		0.159 **
Constant Term		0.173 **	
Friday			0.037 **
TR Cut		-0.352 **	-0.237 **
CPI –			-0.105 *
ISM +		0.612 *	
NFP –			-0.062 *
RET –			-0.066 **
MPR/Testimony MP –		2.575 **	-0.745 **
MPR/Testimony EO –	-0.070 **		
Speech MP –	-0.089 **	-0.817	-0.617 **
Speech EO +		0.684 *	
Exclusion Restriction	48.7	43.9	47.3
ARCH 1-2 Test	1.132	0.543	2.060

Notes: * (**) indicates significance at a 5% (1%) level. Standard errors are heteroscedasticity-consistent (Bollerslev and Wooldridge, 1992). Number of observations: 1106.

A comparison of the results in Tables 1–2 reveals some interesting insights. First, we find that there are generally fewer significant news variables in the money market after the crisis than during the currency board era. In particular, neither central bank actions nor macroeconomic indicators exert a significant influence. We interpret this as evidence that the Argentine economy has become less dependent on events in the United States after the abandonment of the currency board.

Second, neither communication about the future course of U.S. monetary policy nor any type of macroeconomic news triggers a significant reaction of dollar-denominated money

market returns. In contrast, peso-denominated assets are affected by a variety of U.S. news. On the one hand, dollar-denominated assets are expected to react more strongly to U.S. news than are peso-denominated assets because of movements in the external value of the U.S. dollar. On the other hand, dollar assets are considered to be much safer investments than are peso-denominated assets and thus markets react less nervously to any U.S. news. The latter interpretation receives indirect support by the sharp increase in the spread between peso- and dollar-denominated assets at the beginning of the financial crisis. Thus, these findings can be interpreted as evidence that during its final years, the currency board was not completely credible and dollar-denominated Argentine assets fulfilled the function of a ‘safe haven’.

5. Conclusions

We study the effects of many types of Fed communication and U.S. macroeconomic shocks on Argentina’s financial market returns. Using a GARCH model, we explore the impact on money, stock, and foreign exchange markets over the period January 1998 to July 2007 after splitting the sample into two subsamples, capturing the currency board and the floating exchange rate regime. We concentrate our analysis on three research questions.

First, do U.S. central bank communication and U.S. macroeconomic announcements exert any influence on Argentine financial market returns? We show that both types of news have a significant impact on money, equity, and foreign exchange markets. The impact is statistically significant and economically relevant (up to 3.3 percentage points during the currency board era).

Second, does the creation of the currency board affect the strength of this effect? Yes, as we conclude that Argentina’s money markets have become less dependent on U.S. events after the breakdown of the currency board. There are fewer significant news variables in the floating exchange rate subsample compared with the currency board subsample. In particular, neither central bank actions nor macroeconomic indicators exert a significant influence.

Third, was the currency board credible during its final years? We find that Argentine assets denominated in dollars are generally influenced by fewer significant variables with smaller coefficients in absolute terms than peso-denominated assets during the currency board subsample. Our results suggest that dollar-denominated assets are seen as safer than peso-denominated assets, which implies that the currency board was not regarded as completely credible by market participants during its final years.

The results of this paper have some policy implications. First, a currency board fosters financial integration. We show that under the pegged exchange rate system, Argentine money

markets react to the same set of macroeconomic variables as U.S. markets. However, they are much less sensitive to U.S. news after the abandonment of the currency board. Thus, financial integration between the two countries has decreased, which suggests that the currency board must have caused a higher degree of financial integration in the first place.

Second, our results suggest that policymakers should consider real economic developments, in addition to monetary policy, in the anchor country before deciding to peg their currency. In a one-sided fixed exchange rate system, the anchor country's central bank sets interest rates according to domestic conditions. Hence, through this channel, domestic conditions of the anchor country have a direct influence on financial markets in the currency board country. Thus, even when there is no particularly high degree of real economic integration between the two countries, financial markets will react to economic shocks in the anchor country.

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Appendix

Table A1: Descriptive Statistics for Currency Board Subsample (January 1998–June 2001)

	3-Month Peso	3-Month Dollar	Merval
Observations	840	840	840
Mean	0.006	0.001	−0.037
Standard Deviation	0.796	0.310	2.376
Skewness	5.006	4.847	0.028
Excess Kurtosis	71.120	68.644	4.289
Minimum	−4.563	−2.063	−13.323
Maximum	11.688	4.563	12.260

Table A2: Descriptive Statistics for Floating Exchange Rate Subsample (January 2002–July 2001)

	3-Month Peso	Merval	ARS/USD
Observations	1107	1107	1107
Mean	−0.005	0.144	−0.006
Standard Deviation	0.190	1.723	0.476
Skewness	3.490	−0.362	0.101
Excess Kurtosis	63.536	2.419	11.459
Minimum	−1.063	−8.627	−3.428
Maximum	2.750	6.701	3.187