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International Financial Contagion: Evidence from the Argentine Crisis of 2001-2002

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Abstract

The aim of this paper is to look for evidence of financial contagion suffered by several countries as a result of the latest Argentine crisis. I focus my attention on a set of countries: Brazil, Mexico, Russia, Turkey, Uruguay, and Venezuela. I also focus exclusively on three financial markets: foreign exchange, stock exchange, and sovereign debt. In order to test the hypothesis of contagion, Vector Autoregression (VAR) models and instantaneous correlation coefficients corrected for heteroscedasticity are estimated. The analysis shows that there is no evdence of contagion. This result provides empirical support for the non-crisis-contingent theories of international financial contagion.

Keywords: International Financial Contagion, Argentine Crisis, VAR models, Correlation.
JEL Classification: C32, F31, G15.

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1 Introduction

A number of dramatic financial crises have marked the nineties: the Exchange Rate Mechanism (ERM) currency attacks in 1992-93, the Tequila crisis in 1994-95, the East Asian crises in 1997, the Russian default in 1998, and the Brazilian devaluation in 1999. Most of these crises spread from one country to others far away on the globe and with very different economic structures. This phenomenon has led many economists to study and try to explain "contagion", i.e. why and through what channels financial crises spread.

There is no one generally accepted definition of contagion in the economic literature. Different papers adopt different definitions as an operative basis for theoretical or empirical work[1].

Forbes and Rigobon (2001) divide theoretical explanations of contagion into two groups: crisis-contingent and non-crisis-contingent theories. The crisis-contingent theories assume that the transmission mechanisms change during a crisis, and therefore market co-movements increase after a shock. Examples of crisis-contingent theories are based on multiple equilibria and endogenous liquidity. International investors could find it rational to suddenly withdraw their capital from a country if they fear to be otherwise left with no claim on a limited pool of foreign exchange reserves. Formal models of contagion with multiple equilibria have been developed, among others, by Masson (1999). An example of crisis-contingent theories in which the transmission mechanism is based on liquidity shocks is due to Goldfajn and Valdes (1997). According to these authors liquidity constraints can induce agents to sell securities of emerging markets once they have incurred losses due to currency and equity depreciations in the crisis country.

The non-crisis-contingent theories assume that any large cross-market correlations after a shock are a continuation of linkages existing before the crisis. Examples of these theories base their explanations of how shocks are transmitted on "real linkages", that is economic fundamentals, such as trade and common global shocks. Glick and Rose (1999) claim that when a crisis country experiences a currency devaluation, its major trading partners and competitors are likely to suffer a speculative attack themselves. This occurs because investors foresee that a depreciation of the first victim-country will turn the trade balance of the partner countries into a deficit requiring a devaluation to balance the trade account. On the other hand, simultaneous crises across countries can occur because of a common, global shock, such as a major shift in industrial countries production or a change in commodity prices. Calvo and Reinhart (1996) and Chuhan *et al.* (1998) relate changes in US interest rates to capital flows in Latin America.

Following Forbes and Rigobon (2002, p. 2224), in this paper contagion is defined as “a significant increase in cross-market linkages after a shock to one country (or group of countries). According to this definition, if two markets show a high degree of co-movement during periods of stability, even if the markets continue to be highly correlated after a shock to one market, this may not constitute contagion. According to this paper’s definition, it is only contagion if cross-market co-movement increases significantly after the shock”. This definition presents two advantages. First, it provides a straightforward test to measure contagion, by measuring the cross-market correlations before and after a shock. Second, tests based on this definition can provide evidence in favour of or against each of the two groups of theories discussed above.

Correlation analysis has been widely used in the empirical literature on contagion. This approach considers a significant increase in correlation between markets as evidence of contagion. A seminal paper by King and Wadhwani (1990) uses this approach to look at changes in correlation coefficients between different markets occurring after the stock market crash in October 1987. A wide number of papers have applied this approach to study the most recent financial crises, finding evidence of large co-movements of asset returns, although it is not clear whether such co-movements increase significantly after a crisis. Baig and Goldfajn (1999) find a significant increase in cross-country correlations among currencies and sovereign spreads of five East Asian countries during the 1997-98 turmoil if compared to other tranquil periods. Bazdresch and Werner (2001) apply the correlation analysis, along with other econometric techniques, to quantify the contagion suffered by Mexico in the financial crises of the period 1997-1999. However, a significant increase in correlations among different countries' markets may not be sufficient evidence of contagion. In fact, Forbes and Rigobon (2002) show that, owing to an increase in volatility of economic variables over crisis periods, higher correlations could simply be due to heteroscedasticity, and therefore be the result of historical high correlation between markets. Hence, empirical tests tend to favour the hypothesis of excessive transmission if heteroscedasticity is not corrected for. More generally, correlation coefficients in specific sub samples tend to be biased in the presence of heteroscedasticity, endogeneity and omitted variables. A number of papers try to solve this problem. Forbes and Rigobon (2002), for example, estimate a model for three financial crises (Wall Street in 1987, Mexico in 1994-95, Asia in 1997) using daily returns of the stock market and short term interest rates, and show that when correlation coefficients are adjusted for the increased volatility, the hypothesis of contagion is rejected in most of the cases. Subsequently, they argue that the increase in correlation is simply a result of interdependence rather than a change in linkages.

Far from being a memory of the past, new crises have opened the second millennium. The first of these crises has been the Argentine one. After nearly four years of recession, in December 2001 Argentina first froze savings deposits as a measure to stop bank runs, and then defaulted on its 155 billion dollars public debt. In January 2002, after a decade of fixed parity with the dollar, the Argentine Peso was first devalued and then was let float.

Whatever the causes of the crisis, since the beginning some media have been talking about contagion, spreading risk, and spillover effects from Argentina to its neighbour countries, mainly Brazil, Uruguay, and Venezuela.

The goal of this paper is to test claims of contagion from Argentina to a set of countries chosen either because they are strictly related through trade and financial linkages, as are Brazil, Venezuela, and Uruguay, or because they have been affected in the past by contagion, such as Mexico and Russia, or, finally, because they are simultaneously affected by a similar crisis, as in the case of Turkey.

The paper is organized as follows. Section 2 describes the econometric methodology; Section 3 presents and discusses the empirical results; Section 4 summarizes and concludes. Data sources and further tests are presented in the Appendix.

2 Empirical methodology

The empirical analysis is carried out without the assumption of a specific theoretical model explaining the causes and mechanism of contagion. I analyse the relationship between the main financial markets of different countries by using two econometric methodologies. First, a Vector Autoregressive (VAR) model is estimated for each of the financial markets to obtain an insight in the causal relationships between the same variables for different countries. According to Bazdresch and Werner (2001, p. 303) "VARs provide for lagged responses between variables, measuring the span of time that shocks take to disappear and providing a first approximation to address issues of causation". Second, instantaneous correlation coefficients, which constitute an intuitive measure of co-movements, are estimated and then tested using the two sample heteroscedastic t-test developed by Forbes and Rigobon (2002).

The financial markets analysed, commonly considered as the main vehicles of contagion, are the foreign exchange, the stock exchange, and the sovereign debt market.

Brazil, Uruguay, and Venezuela are considered because they are Argentina's main neighbours. I also consider Russia and Mexico because recently (1994 and 1998) they have been affected by financial crises and contagion. Finally, Turkey is included because it is experiencing a serious financial crisis at the same time as Argentina.

The Appendix contains a detailed discussion of the variables and the sources of data.

2.1 VAR model

In this paper, a VAR model is estimated for each financial market using daily data ranging from December 1st, 2001 to November 29th, 2002[2]. The order of the model is chosen on the basis of the sequential log-likelihood ratio test, which selects a model of order 3 for the foreign exchange and the stock exchange markets, and a model of order 4 for the sovereign debt market. Prior to running the estimation, the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were carried out on the logarithms of the time series in order to test for unit roots: all variables are I(1) at a 5% confidence level, with both a constant and a linear trend. The results of the unit root tests are reported in Tables 1, 2, and 3.[3]

[Insert Tables 1,2 and 3 about here]

Formally, the VAR system in a standard or reduced form is given by:

$$\mathbf{y}_t = \mathbf{c} + \mathbf{\Phi}_1 \mathbf{y}_{t-1} + \mathbf{\Phi}_2 \mathbf{y}_{t-2} + ... + \mathbf{\Phi}_p \mathbf{y}_{t-p} + \boldsymbol{\varepsilon}_t \qquad (1)$$

where $\mathbf{y}_t$ is an $(n \times 1)$ vector of variables, $\mathbf{c}$ is an $(n \times 1)$ vector of constants, $\mathbf{\Phi}_j$ is an $(n \times n)$ matrix of autoregressive coefficients for $j = 1, 2, ..., p$, and $\boldsymbol{\varepsilon}_t$ is a multivariate white noise process, i.e., $\boldsymbol{\varepsilon}_t \sim i.i.d.N(\mathbf{0}, \mathbf{\Omega})$, with $\mathbf{\Omega}$ an $(n \times n)$ symmetric positive definite matrix.

In the three VAR models estimated, the vector $\mathbf{y}_t$ includes the following variables.

- For the *exchange rates* $\mathbf{y}_t = \{\text{ARGpeso}_t, \text{BRAreal}_t, \text{MEXpeso}_t, \text{RUSrouble}_t, \text{TURlira}_t, \text{URUpeso}_t, \text{VENbolivar}_t\}'$

- For the *stock market indexes* $\mathbf{y}_t = \{\text{ARGgener}_t, \text{BRAbovespa}_t, \text{MEXipc}_t, \text{RUSrts}_t, \text{VENgener}_t\}'$. Due to the insignificant level of capitalization of the Uruguayan and the Turkish stock market, these two countries are excluded from the model.

- For the *sovereign debt spreads* $\mathbf{y}_t = \{\text{ARG}_t, \text{BRA}_t, \text{MEX}_t, \text{RUS}_t, \text{TUR}_t, \text{VEN}_t\}'$. Data on the Uruguayan sovereign spreads are not available.

2.2 Correlation coefficients

The second technique is based on instantaneous correlation coefficients, which give an intuitive measure of the degree of co-movement between economic variables. Forbes and Rigobon (2002) show that an increase in the variance of a financial variable over a crisis period biases the estimation of the correlation coefficients in favour of the conclusion that the correlation between variables is significantly higher in turmoil periods than in tranquil periods, and thus contagion exists. In order to eliminate this bias they propose to correct the standard correlation coefficient by using the formula:

$$\rho = \frac{\rho^u}{\sqrt{1 + \delta[1 - (\rho^u)^2]}} \tag{2}$$

where ρ^u is the unadjusted (i.e., conditional on heteroscedasticity) correlation coefficient, δ is the relative increase in the variance of the crisis country's variable from the tranquil to the turmoil period, and ρ is the adjusted correlation coefficient. Once corrected in this fashion, the significance of the increase of the correlation coefficient during the crisis period as compared to the tranquil period is tested using a one-tail t-test, assuming a t-student asymptotic distribution. The hypotheses are:

$$H_0 : \rho^c \geq \rho^t \tag{3}$$

$$H_1 : \rho^c < \rho^t \tag{4}$$

where ρ^c represents the adjusted correlation coefficient for the crisis period, while ρ^t represents the correlation coefficient for the tranquil period. The tranquil period ranges from January 1st, 2001 to May 31st, 2001, which is a good control period for all of the three financial markets. The crisis period goes from December 1st, 2001 to November 29th, 2002.

3 Empirical results

In this Section, I use VAR models and correlation coefficients corrected for heteroscedasticity to analyse the contagion effects of the Argentine financial crisis. Based on the results of the unit root tests in Subsection 2.1, the correlation analysis considers log-differences of the variables of interest to avoid spurious regression issues. As for the VAR analysis, when the time series are nonstationary, as in this case, the VAR model can be specified in pure differences, in levels, or it can be specified as a Vector Error Correction Model (VECM) to allow for the existence of cointegration. Following the line of argument of Ramaswamy and Slok (1998), I do not use a VECM since this paper is not focused on the long run relationship among the variables.

To make the VAR analysis consistent with the correlation one, variables in log-differences instead of log-levels are used. Appendix reports the results obtained in the correlation analysis by using variables in log-levels rather than in log-differences.

3.1 VAR analysis

Generalized impulse response functions and *generalized forecast error variance decompositions* provide adequate tools to assess the impact of one shock on an Argentine financial market on the other countries[4]. The duration of this effect is also highlighted.

3.1.1 Foreign exchange markets

Table 4 shows to what extent the forecast error variance of the Argentine exchange rate can explain the variance of other countries' exchange rates.

[Insert Table 4 about here]

The contemporary effect is negligible for all markets, and it remains such for Brazil and Mexico up to 15 days. The effect is somewhat bigger for Turkey (1.78% after 10 days), Uruguay (2.2% after 10 days), and Venezuela (1.86% after 10 days). Russia's currency seems to be much more affected by a shock to the Argentine's Peso: 8.79 % after 5 days and 8.97% after 15 days.

As for the immediate impact, Figure 1 shows that a shock on the Argentine currency has no significant effect on any other currencies.

[Insert Figure 1 about here]

In the next period, it affects the Russian Rouble, the Turkish Lira, the Uruguayan Peso, and the Venezuelan Bolivar, but these effects die out after just six days or so.

3.1.2 Stock markets

Table 5 reports the percentage effect of the Argentina's stock index variance on the forecast error variance of the other countries' stock indexes.

[Insert Table 5 about here]

The effect on Brazil is almost null while it is very small on Mexico (1.74% after 5 days), Russia (1.66% after 5 days and up to 15 days), and Venezuela (1.66% after 5 days and up to 15 days).

The impulse response function shown in Figure 2 reveals a similar scenario: a one standard deviation innovation in Argentina's stock index does not produce any statistically significant effect on Russia, Mexico, Brazil, and Venezuela.

[Insert Figure 2 about here]

To sum up, stock markets in the countries under analysis show an insignificant reaction to the crisis in Argentina.

3.1.3 Sovereign debt markets

Sovereign debt spreads seem slightly more reactive to the Argentine crisis, though there is still no statistically significant effect. Only the forecast error variance of Brazil and Venezuela is determined by more than 3% by the Argentine spreads from 0 to 15 days ahead forecast.

[Insert Table 6 about here]

Figure 3 shows that, though in the right direction, a one standard deviation innovation in Argentine spreads has a small and short lasting effect on the other countries' spreads.

[Insert Figure 3 about here]

3.2 Correlation analysis

Correlation analysis gives a straightforward measure of variables' co-movement. In order to have a complete picture of the timing of the crisis in Argentina and of its potential effects on other countries, I analyse four time-intervals. These four time-intervals all start when the crisis begins: the first two weeks, the first two months, the first four months and the all-crisis interval until the end of the sample (November 29th, 2002). I expect to find evidence of an increasing correlation between markets immediately after the crisis began, and a diminishing correlation in later weeks.

3.2.1 Foreign exchange markets

Looking at table 7, it is clear that exchange rate correlations do not exhibit any degree of contagion.

[Insert Table 7 about here]

Correlation coefficients decrease in the crisis period for Brazil (after the first two weeks) and Uruguay, while for the rest of the countries the increase of the coefficients is negligible. However, this analysis is somewhat questionable, since the Argentine Peso exchange rate versus the US Dollar was fixed until January 4th, 2002, i.e. for all the tranquil period and part of the crisis period. Note that the Uruguayan exchange rate too, was fixed until June 2002.

3.2.2 Stock markets

Stock market correlations, shown in Table 8, exhibit a sharp decrease in the correlation coefficients for Brazil, Mexico, Russia, and Venezuela in all periods: they drop close to zero immediately after the crisis begins, and remain at this level up to the end of the sample period.

[Insert Table 8 about here]

Therefore, no stock markets in the set of countries analysed seem to have suffered contagion from Argentina. The correlation between the Turkish and the Uruguayan stock markets and the Argentine one is not available due to the scarce capitalization of the first two, hence the blank columns in Table 8.

3.2.3 Sovereign debt markets

In the sovereign debt markets, as well as in the stock markets, the correlation coefficients decrease sharply. The sovereign debt market does not show any evidence of contagion.

[Insert Table 9 about here]

4 Conclusion

This paper tests the hypothesis of contagion for the latest Argentine financial crisis which began in December 2001. The set of countries is chosen either because they belong to the same region (Brazil, Uruguay, and Venezuela), or because they have recently been affected by contagion (Russia and Mexico), or because they are experiencing a severe financial crisis at the same time as Argentina (Turkey). Three different financial markets are considered: foreign exchange, stock exchange, sovereign debt. The hypothesis of contagion is tested by using Vector Autoregressive (VAR) models, and correlation coefficients corrected to solve for heteroscedasticity, as suggested by Forbes and Rigobon (2002). Although rather small effects between the variables emerge in the VAR analysis, contagion is definitely excluded by the estimation of the correlation coefficients. In the foreign exchange market these correlation coefficients appear to be smaller during the crisis periods, if compared to the tranquil period, for Brazil and Uruguay. The coefficients increase slightly for the rest of the countries. The stock exchange market exhibits a sharp decrease in the correlation coefficients during the crisis period for all the countries in the sample. As for the sovereign debt, the VAR model shows a small but noticeable reaction of the Brazilian, Mexican, Russian, and Venezuelan spreads to the Argentine turmoil. The analysis of the correlation coefficients, however, shows no evidence of contagion.

All this seems to suggest that investors perceived the Argentine crisis as an isolated case, which probably arose as a consequence of the mismanagement of the public finance. Other Latin American countries (Brazil, Mexico, Uruguay, and Venezuela), characterized by sounder fundamentals, seem to have been immune to the Argentine turmoil.

The evidence provided in this paper can be seen as supportive of the group of non-crisis-contingent theories, that is, of the theories which tend to base explanations of contagion on "real linkages" among countries.

5 Appendix

5.1 Data

Exchange rates: ARGpeso, BRAreal, MEXpeso, RUSrouble, TURlira, URUpeso, and VENbolivar indicate the daily exchange rate *vis-a-vis* the US Dollar for Argentine Peso, Brazilian Real, Mexican Peso, Russian Rouble, Turkish Lira, Uruguayan Peso, and Venezuelan Bolivar. The source is Datastream Advance 3.5.

Stock market indexes: ARGgener, BRAbovespa, MEXipc, RUSrts, and VENgener indicate the daily stock leading index for Argentina, Brazil, Mexico, Russia, and Venezuela. Again, the source is Datastream Advance 3.5.

Sovereign debt spreads: ARG, BRA, MEX, RUS, TUR, and VEN indicate the daily Emerging Markets Bonds Index + (EMBI+) provided by the investment bank J. P. Morgan. The EMBI+ is a composite index of the external-currency-denominated debt instruments of the emerging markets. It tracks the spreads between yields of the sovereign debt of the emerging markets and that of the corresponding US Treasury bonds, thus giving a benchmark measure of risk premium and, therefore, of country risk as perceived by investors.

5.2 Alternative tests on level variables

Tables 10, 11, and 12 report the results of the correlation analysis on the log-levels rather than the log-differenced variables. As shown in Subsection 2.1, all the time series in log-levels are I(1). This supports the procedure of using log-differences as a way of avoiding the issue of spurious regression. Nevertheless, looking at the variables in log-levels is interesting as it shows that the correlation analysis is not robust to the way we transform variables. In fact, though contagion seems to be absent in the estimation of the correlation coefficients of the exchange rates, Table 11[5] shows that the stock exchange market exhibits a significant degree of contagion from Argentina to Mexico in the first two weeks of the crisis period, and to Russia in the first two months. No significant effect can be observed, however, on the other countries' stock indexes.

[Insert Tables 10 and 11 about here]

As for the sovereign spreads, the analysis of the coefficients reported in Table 12 makes clear that for Mexico, Turkey, and Venezuela it is legitimate to talk about contagion. Correlation coefficients for these three countries, in fact, increase in a significant way over the whole crisis period. Contagion emerges also in the first two months for Venezuela.

[Insert Table 12 about here]

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Any views expressed are mine only and not necessarily those of the Ministry of Economy and Finance of Italy.

Notes

[1]See Pericoli and Sbracia (2003) for a critical review of theoretical and empirical studies.

[2]Although fixing a starting date for a financial crisis is somewhat arbitrary, in this study I consider December 1st, 2001, when savings accounts were frozen, the starting point of the Argentine crisis. Since, at the time this paper is written, the crisis is still going on, I choose a sample period of one year ending on November 29th 2002.

[3]Lag lenghts for the ADF test are in square braquets. * indicates rejection of the null hypothesis of unit root at 5% level. The Turkish and the Uruguayan Stock Market Indexes are not considered due to the negligible level of capitalization. Data on the Uruguayan Sovereign Spreads are not available.

[4]Unlike the orthogonalized impulse response function and the orthogonalized forecast error variance decomposition, the generalized procedure is not dependent on the ordering of the variables in the VAR. For further details see Pesaran and Pesaran (1997).

[5]I report any 1 percent (∗∗∗), 5 percent (∗∗) or 10 percent (∗) statistically

significant increase of the correlation coefficients in the crisis period from the tranquil period.

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COUNTRY	ADF		PP		Order of Integration
	lnER	$\triangle$lnER	lnER	$\triangle$lnER	
Argentina	-1.67[1]	-19.20[0]*	-1.62	-19.09*	I(1)
Brazil	-1.22[2]	-19.78[1]*	-1.44	-19.85*	I(1)
Mexico	-1.75[0]	-23.26[0]*	-1.64	-23.31*	I(1)
Russia	-1.63[2]	-21.54[1]*	-1.72	-27.20*	I(1)
Turkey	-2.47[2]	-18.73[1]*	-2.33	-19.75*	I(1)
Uruguay	-1.49[0]	-22.64[0]*	-1.45	-22.70*	I(1)
Venezuela	-2.24[8]	-18.90[1]*	-1.89	-25.79*	I(1)

Table 1: Unit root tests for the Exchange Rates.

COUNTRY	ADF		PP		Order of Integration
	lnSI	$\triangle$lnSI	lnSI	$\triangle$lnSI	
Argentina	-2.00[0]	-20.88[0]*	-2.02	-20.83*	I(1)
Brazil	-1.91[1]	-19.46[0]*	-1.77	-19.38*	I(1)
Mexico	-1.85[0]	-20.63[0]*	-1.93	-20.60*	I(1)
Russia	-1.88[0]	-21.65[0]*	-1.94	-21.65*	I(1)
Turkey	-	-	-	-	-
Uruguay	-	-	-	-	-
Venezuela	-2.98[0]	-18.34[1]*	-2.93	-23.89*	I(1)

Table 2: Unit root tests for the Stock Indexes.

COUNTRY	ADF		PP		Order of Integration
	lnSS	△lnSS	lnSS	△lnSS	
Argentina	-1.17[0]	-19.43[0]*	-1.17	-19.44*	I(1)
Brazil	-1.70[2]	-13.92[1]*	-1.90	-16.48*	I(1)
Mexico	-1.93[0]	-15.62[1]*	-1.92	-20.91*	I(1)
Russia	-1.40[0]	-14.44[1]*	-1.51	-18.46*	I(1)
Turkey	-1.84[1]	-13.75[1]*	-1.62	-20.87*	I(1)
Uruguay	-	-	-	-	-
Venezuela	-2.73[0]	-22.98[0]*	-2.52	-23.40*	I(1)

Table 3: Unit root tests for the Sovereign Spreads.

Day	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
0	0.8E-3	0.0013	0.0026	0.9E-4	0.0040	0.7E-4
5	0.0012	0.0055	0.0879	0.0156	0.0191	0.0182
10	0.0013	0.0085	0.0897	0.0178	0.0220	0.0186
15	0.0013	0.0086	0.0897	0.0179	0.0221	0.0187

Table 4: Exchange Rate generalized forecast error variance decomposition: percentage of forecast error variance explained by the Argentine Peso.

Day	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
0	0.0031	0.0118	0.0164	-	-	0.0028
5	0.0032	0.0174	0.0166	-	-	0.0166
10	0.0032	0.0179	0.0166	-	-	0.0166
15	0.0032	0.0179	0.0166	-	-	0.0166

Table 5: Stock Index generalized forecast error variance decomposition: percentage of forecast error variance explained by the Argentina's General.

Days	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
0	0.0368	0.0096	0.0192	0.2E-3	-	0.0275
5	0.0375	0.0138	0.0253	0.0173	-	0.0360
10	0.0375	0.0140	0.0253	0.0176	-	0.0363
15	0.0375	0.0140	0.0253	0.0176	-	0.0363

Table 6: Sovereign Debt Spread generalized forecast error variance decomposition: percentage of forecast error variance explained by the Argentine Spreads.

	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
Tranquil Period	0.0302	-0.0077	-0.0480	-0.0630	0.0399	-0.0434
Crisis period						
First two weeks	0.0375	0.0645	0.0018	-0.0071	0.0168	0.0017
First two months	0.0008	-0.0010	-0.0003	-0.0011	0.0009	-0.0006
First four months	0.0010	-0.0011	-0.0002	-0.0005	2.4E-05	-0.0005
First year	0.0004	-0.0005	2.2E-05	-0.0001	0.0002	-0.0004

Table 7: Exchange Rates correlation coefficients with Argentine Peso for different periods.

	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
Tranquil Period	0.7212	0.4798	0.2676	-	-	0.1792
Crisis period						
First two weeks	-0.0288	0.0534	-0.0149	-	-	-0.1094
First two months	0.0225	0.0087	0.0419	-	-	-0.0030
First four months	0.0247	0.0149	0.0479	-	-	-0.0295
First year	0.0116	0.0264	0.0522	-	-	-0.0174

Table 8: Stock Indexes correlation coefficients with Argentine General Stock Index for different periods.

	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
Tranquil Period	0.8544	0.5415	0.5686	0.3513	-	0.6674
Crisis period						
First two weeks	0.1832	0.0809	0.0469	-0.0618	-	0.1632
First two months	0.2757	-0.0009	0.0897	-0.0072	-	0.1667
First four months	0.2686	6.E-05	0.0883	-0.0211	-	0.1015
First year	0.1852	0.1099	0.1305	-0.0093	-	0.1274

Table 9: Sovereign Debt Spreads correlation coefficients with Argentine Spreads for different periods.

	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
Tranquil Period	-0.0675	0.1042	-0.0141	-0.0918	-0.0559	-0.0766
Crisis period						
First two weeks	-0.0611	-0.0279	0.0354	-0.0641	0.0526	0.0819
First two months	0.0006	0.0001	0.0021	-0.0031	0.0003	0.0014
First four months	0.0002	-0.0006	0.0027	-0.0013	0.0010	0.0008
First year	0.0006	0.0008	0.0025	0.0005	0.0008	0.0010

Table 10: Exchange Rates correlation coefficients with Argentine Peso for different periods.

	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
Tranquil Period	0.850	0.020	-0.343	-	-	0.620
Crisis period						
First two weeks	0.393	0.826***	0.130	-	-	0.079
First two months	0.244	0.006	-0.103*	-	-	0.217
First four months	-0.022	-0.261	-0.320	-	-	0.243
First year	0.140	0.073	-0.281	-	-	0.210

Table 11: Stock Indexes correlation coefficients with Argentine General Stock Index for different periods.

	Brazil	Mexico	Russia	Turkey	Uruguay	Venezuela
Tranquil Period	0.963	-0.340	-0.192	0.543	-	-0.131
Crisis period						
First two weeks	-0.865	-0.845	-0.898	-0.905	-	0.186
First two months	0.163	-0.368	-0.250	-0.458	-	0.726***
First four months	-0.626	-0.622	-0.583	-0.766	-	-0.361
First year	0.845	0.585***	-0.249	0.693***	-	0.172***

Table 12: Sovereign Debt Spreads correlation coefficients with Argentine Spreads for different periods.

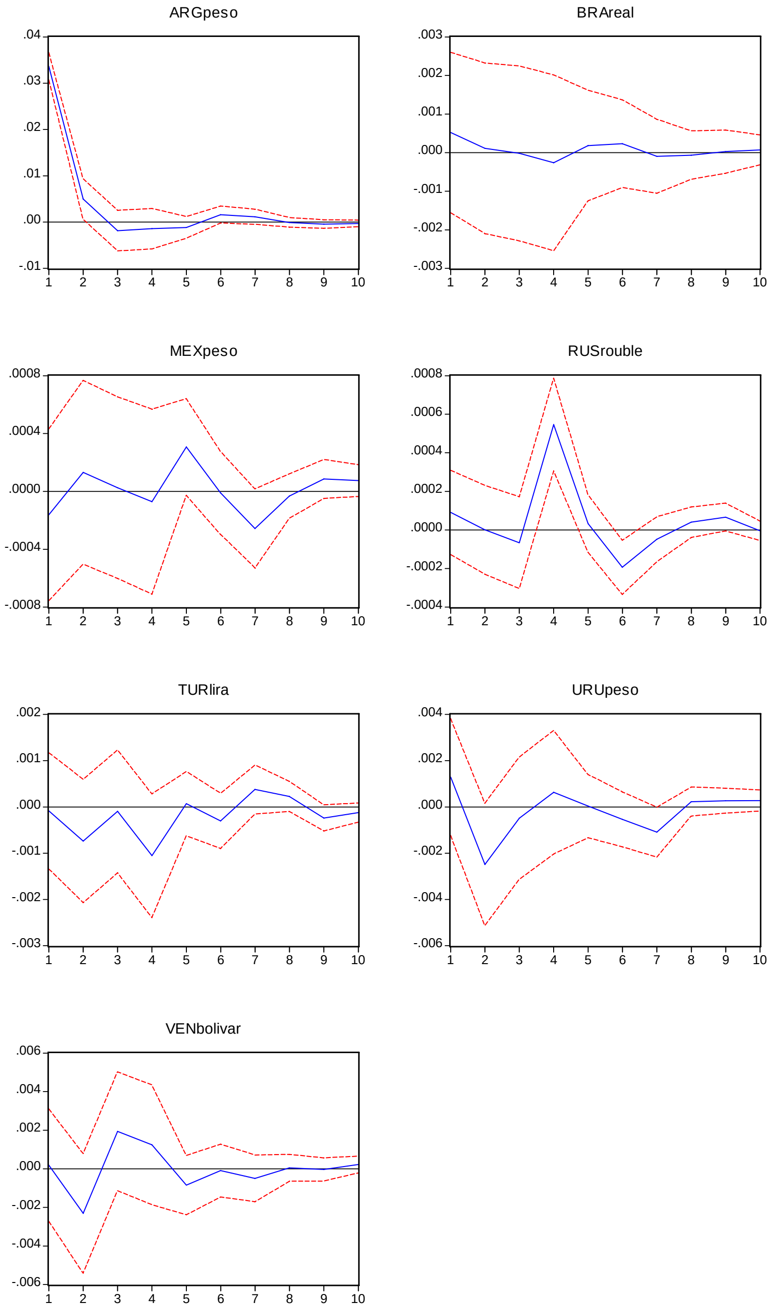

Figure 1: Response of each country's Exchange Rate to a generalized one standard deviation innovation in Argentina's Exchange Rate.

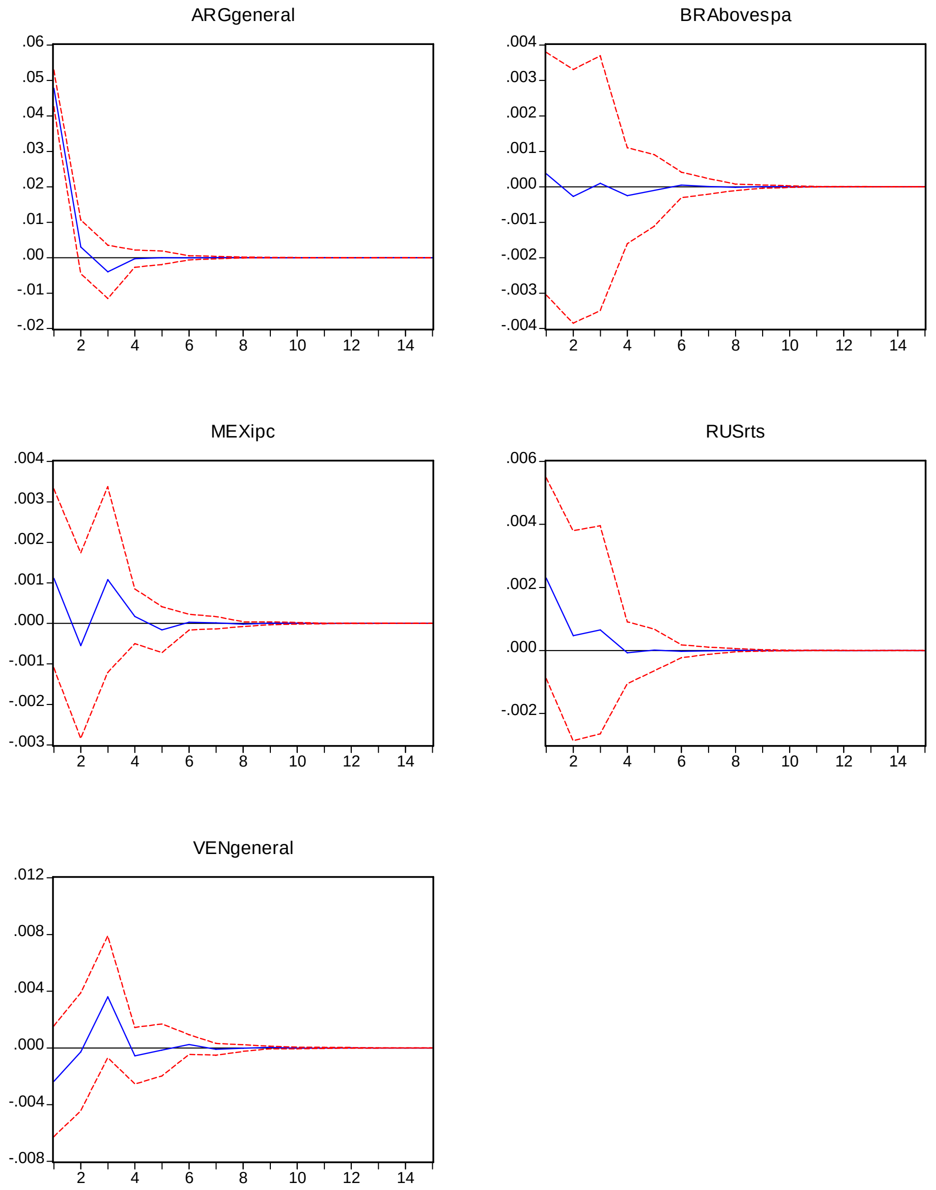

Figure 2: Response of each country's leading Stock Market to a generalized one standard deviation innovation in Argentina's Stock Market.

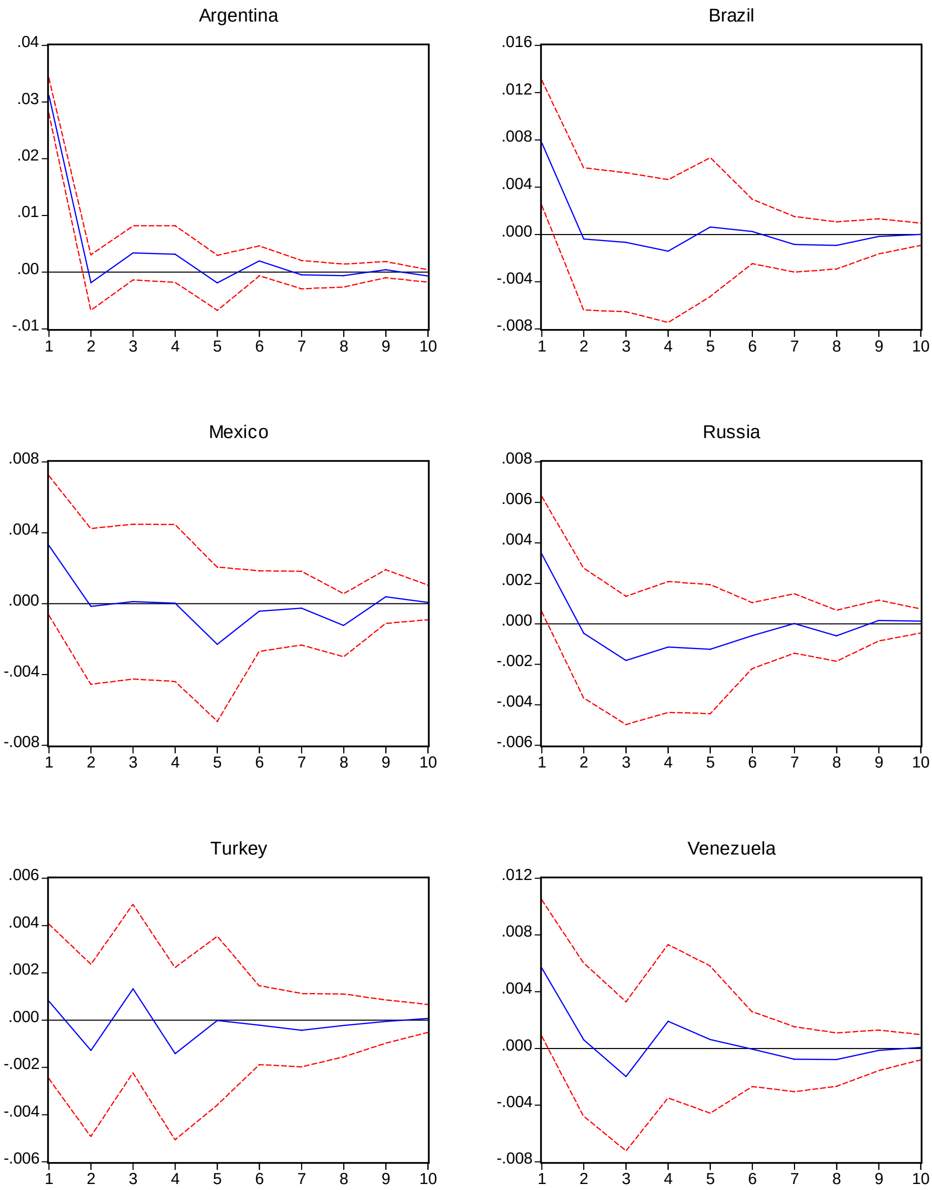

Figure 3: Response of each country's Sovereign Spreads to a generalized one standard deviation innovation in Argentina's Sovereign Spread.