

IMF Working Paper

The Influence of “Big Brothers:”
How Important are Regional Factors
for Uruguay?

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IMF Working Paper

Western Hemisphere Department

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Abstract

This Working Paper should not be reported as representing the views of the IMF.

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This paper examines the role played by regional factors in Uruguay, identifies the sources and transmission mechanisms of shocks stemming from the region, and assesses how vulnerable Uruguay is to a potential crisis in the region. Using a VAR model with block exogeneity restrictions, it finds that shocks from Argentina—which account for about 20 percent of Uruguayan output fluctuations—have large and rapid effects. This is mainly due to the existence of idiosyncratic real and financial linkages between Uruguay and Argentina, which also explain the very high correlation between their business cycles. The analysis of previous crises in the region suggests that despite the importance of these strong linkages, and despite the fact the two deepest crises in recent Uruguayan history followed crises in Argentina, Uruguay is now clearly less vulnerable to financial contagion from the region.

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I. INTRODUCTION

The Uruguayan economy has historically been very sensitive to changes in regional economic conditions. In addition to the typical external disturbances faced by small open economies, such as shocks to terms of trade, to capital flows, or to the rest of the world's demand, it is subject to a number of idiosyncratic shocks stemming from its relative big neighbors Brazil and—especially—Argentina. Some of these shocks are different in nature and intensity from traditional external shocks, are propagated through different channels and involve different adjustment mechanisms.

The main objective of this paper is to examine the role played by regional factors and to determine how vulnerable Uruguay is to potential turmoil in the region. To this end, the paper quantifies the extent of regional spillovers to the Uruguayan economy, and identifies some idiosyncratic financial and real linkages with Argentina that explain the high comovement of business cycles in these two countries. The paper also examines past crisis episodes in the region, trying to shed some light on the repercussions of potential financial turbulence in one of the neighbor countries.

Understanding the role of regional influences is important to conduct macroeconomic policy in Uruguay. A correct identification and assessment of the sources and propagation mechanisms of regional disturbances is key to the design of economic policies—in particular monetary and exchange rate policy—both in terms of policy responses in the event of a shock and to ex-ante measures to reduce vulnerabilities.

The main results of the paper confirm the key role played by regional influences, especially from Argentina. Shocks stemming from this neighbor explain about 20 percent of Uruguay's output fluctuations. Moreover, a typical Argentine shock has large and rapid effects on Uruguay's GDP growth. On the other hand, shocks from Brazil do not appear to account for a significant fraction of Uruguay's GDP fluctuations—despite the larger importance of Brazil as a destination for Uruguay's exports. This is mainly due—in addition to a similar commodity export base and similar exchange rate policies in certain periods—to the existence of idiosyncratic real and financial linkages between Uruguay and Argentina.

Despite the importance of these linkages, and despite the fact that the two largest financial and economic crises in recent Uruguayan history followed deep crises in Argentina, one cannot conclude that the potential occurrence of a new crisis in the region would necessarily cause a financial crisis in Uruguay. For once, the occurrence of simultaneous crises in Uruguay and Argentina can at least partially be explained by common external shocks affecting the region. In fact, not every past crisis episode in Argentina triggered a crisis in Uruguay, as evidenced by the 1989-90 hyperinflation crisis in Argentina. Regarding Brazil, past episodes of financial turbulence in Brazil did not cause major financial turmoil in Uruguay. Finally, the Uruguayan economy has reduced vulnerabilities to regional financial shocks, with sounder macroeconomic fundamentals, a more robust and better regulated

banking system with lower exposure to Argentina, and a significantly reduced regional concentration of exports.

The rest of the chapter is organized as follows. The next section briefly reviews the related literature. Section III illustrates the high comovement of business cycles in the region, and describes the idiosyncratic and strong linkages that explain the particularly high correlations between Uruguay and Argentina. Section IV examines the role played by regional influences as sources of output fluctuations in Uruguay, and how GDP growth has tended to react to shocks stemming from Argentina, Brazil, and the rest of the world. Section V looks at past crisis episodes in the region, trying to shed some light on Uruguay's vulnerability to a potential new crisis in the region. Finally, section VI ends with some concluding remarks.

II. LITERATURE REVIEW

The impact of regional influences on the Uruguayan economy has been studied from different empirical and theoretical perspectives. Most of this literature focuses on real shocks originating in the region, which are mainly propagated through trade linkages. In spite of their importance, the key financial linkages with Argentina have not been deeply analyzed.

Favaro and Sapelli (1986) quantify the regional linkages of the Uruguayan economy using VAR models for the period 1943-1984, finding a large impact of regional variables—especially bilateral real exchange rates. Talvi (1994) develops an intertemporal optimization model with both tradable and regional goods in order to calibrate the importance of Argentina during two exchange rate-based stabilization programs attempted in Uruguay (launched in October 1978 and December 1990, respectively). Bergara, Dominioni and Licandro (1994) develop a model in the tradition of the Dutch disease and booming sector models adding a regional tradable sector, to analyze the effects of a regional demand shock and a shock to external capital inflows. Masoller (1998) develops a model to understand the mechanisms of transmission of regional shocks. In the empirical section, he estimates a near-VAR model to assess the macroeconomic impact of regional shocks in Uruguay.

Bevilaqua, Catena and Talvi (1998) assess the macroeconomic vulnerability of Argentina, Paraguay, and Uruguay to real devaluations in Brazil by formalizing the concept of regional goods—both empirically and a theoretically—and focusing on trade linkages. Kamil and Lorenzo (1998) estimate the correlation between the Uruguayan business cycle and the cyclical component of some key regional macroeconomic variables, and find that the Uruguayan business cycle is strongly influenced by regional factors. More recently, Voelker (2004) analyzes the effect of regional shocks in Uruguay's output at a sectorial level, and finds that most sectors are significantly influenced by shocks to output and relative prices in the region—with shocks from Argentina having the largest impact. Finally, Eble (2006) assesses Uruguay's growth performance during the last decades, finding that the country's exposure to regional shocks has adversely affected growth in Uruguay.

III. REGIONAL LINKAGES: THE INFLUENCE OF “BIG BROTHERS”

A. Regional Business Cycle Comovements

Uruguay’s business cycle is highly correlated with that of its regional neighbors, especially Argentina (Figures 1 and 2). For the whole sample (1980Q1–2009Q2), the contemporaneous correlation between Uruguay’s and Argentina’s cyclical components of GDP is 0.61, and there is evidence that Argentina’s business cycle leads Uruguay’s one by one quarter (Table 1). In fact, the highest correlation in the cross-correlogram is the one between Uruguay’s GDP in quarter t and Argentina’s GDP in quarter $t-1$, with a coefficient equal to 0.67. The correlation between Uruguay’s and Brazil’s business cycles is positive but smaller than the one with Argentina (with a contemporaneous coefficient equal to 0.41); and there is evidence that the Brazilian business cycle leads the Uruguayan one by three quarters (Table 2).

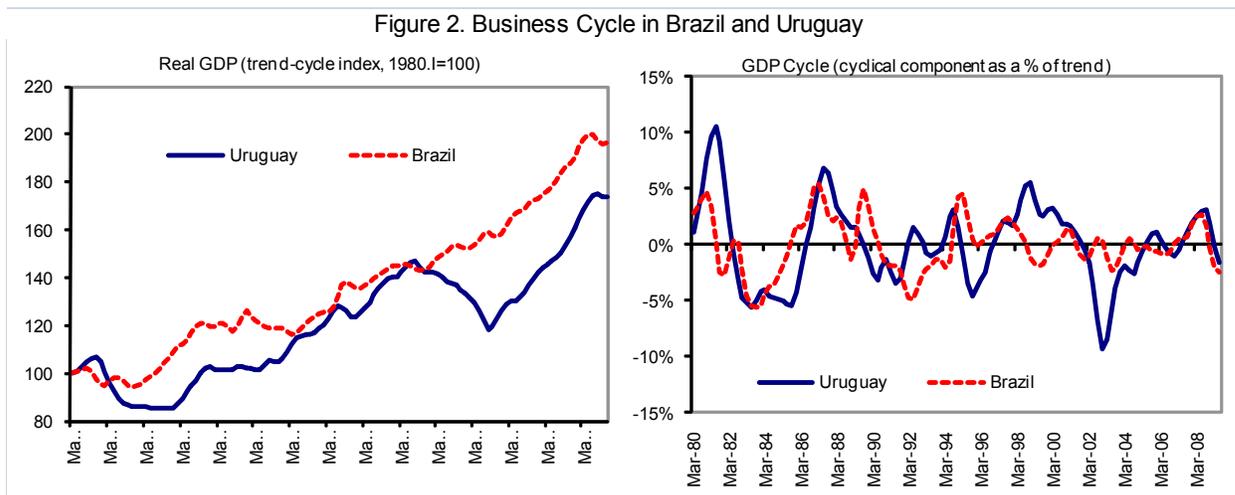
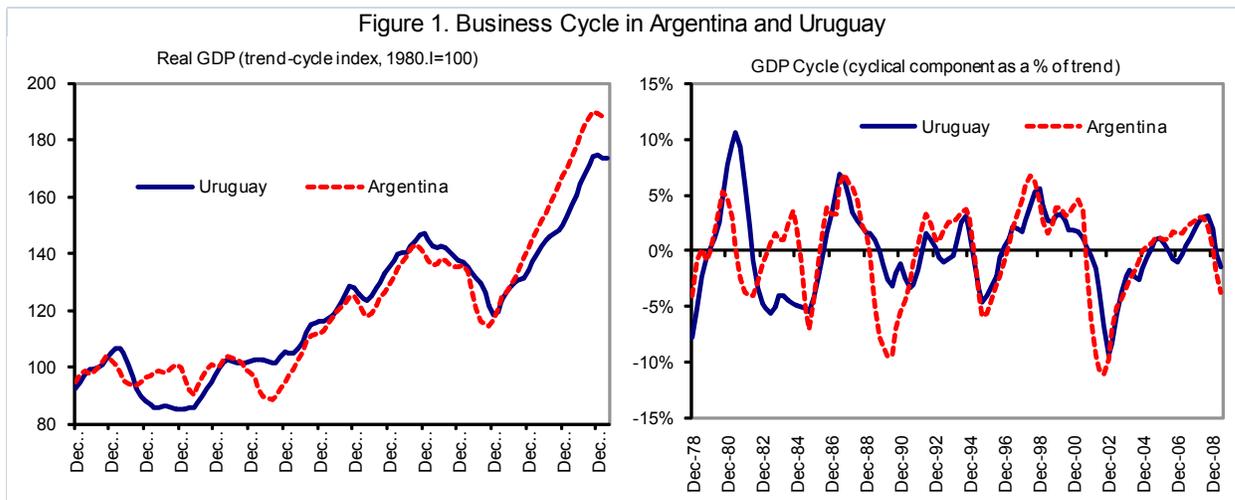


Table 1. Cross Correlations of Uruguayan and Argentine Business Cycles
(1980.IV-2009.I)

Cross correlations of Uruguay's GDP in period t and Argentina's GDP in period									
t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	
0.452	0.580	0.642	0.670	0.606	0.472	0.311	0.162	0.041	

1/ Cyclical components of the GDP series obtained using the Hodrick-Prescott filter

Table 2. Cross Correlations of Uruguayan and Brazilian Business Cycles
(1978.IV-2009.I)

Cross correlations of Uruguay's GDP in period t and Argentina's GDP in period									
t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	
0.452	0.471	0.465	0.444	0.415	0.371	0.308	0.220	0.110	

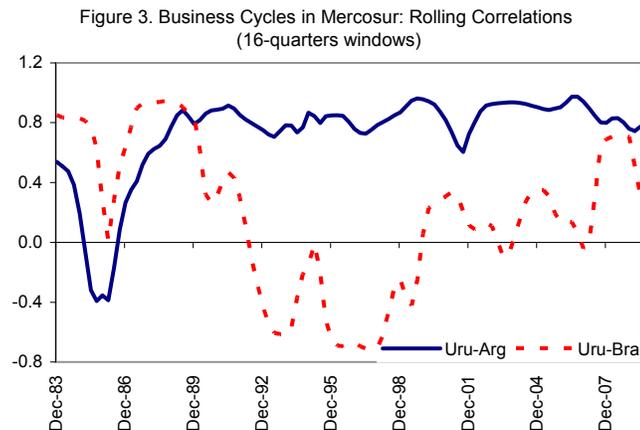
1/ Cyclical components of the GDP series obtained using the Hodrick-Prescott filter

The correlation with the regional neighbors' business cycles has changed over time. For instance, the correlation between Uruguay's and Argentina's cyclical components of GDP is much larger in 1990–2009 than in the whole sample—with the correlation coefficient reaching 0.86 (Table 3). Against this background, Figure 3 illustrates the rolling correlations between Uruguay's GDP cycle and those of Argentina and Brazil.² While correlations with Argentina have remained high since the early 1990s, they have declined somewhat in the most recent years.³ Correlations with Brazil, in turn, seem to have increased in the last years.⁴

Table 3. Cross Correlations of Uruguayan and Argentine Business Cycles
(1990.IV-2009.I)

Cross correlations of Uruguay's GDP in period t and Argentina's GDP in period									
t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	
0.537	0.688	0.804	0.865	0.833	0.688	0.506	0.342	0.209	

1/ Cyclical components of the GDP series obtained using the Hodrick-Prescott filter



² Rolling correlations were computed using 16-quarter windows, considering lags of one quarter for Argentina's GDP cycle and three quarters for Brazil's, based on the cross-correlogram for the whole period.

³ It is worth noting that the correlation with Argentina in recent years is partly explained by the fact that both economies experienced a simultaneous strong recovery following the 2001 and 2002 crises.

⁴ This could reflect either a higher influence of Brazil, or a more similar reaction to global shocks.

B. Idiosyncratic Linkages Between Uruguay and Argentina

Strong trade and financial linkages help explaining the high sensitivity of the Uruguayan economy to regional influences, in particular from Argentina. These linkages—in addition to a similar commodity export base, and similar exchange rate policies during some periods—are key determinants of the high comovement of business cycles.

Although it has diversified in recent years, Uruguay's external trade has historically been largely dependent on the region. The trade openness process initiated in the 1970s was accompanied by a high concentration of trade with both Argentina and Brazil. This regional concentration was due not only to geographic reasons but also to institutional considerations: the preferential trade agreements signed with Argentina and Brazil in the 1970s and the creation of Mercosur in the 1990s.⁵ The share of Brazil and Argentina in Uruguayan trade increased significantly through the 1990s, with these two countries becoming the most important trading partners (Table 4). In particular, Brazil has been the largest single destination of Uruguay's exports of goods, accounting for a share of total exports twice as large as that of Argentina in recent years. In the last decade, however, there has been a diversification of export destinations, with the regional share declining from about 45 percent in 1996–00 to 25 percent in 2006–08.

Table 4. Concentration of Uruguayan External Trade in Goods
(percent of total exports and imports)

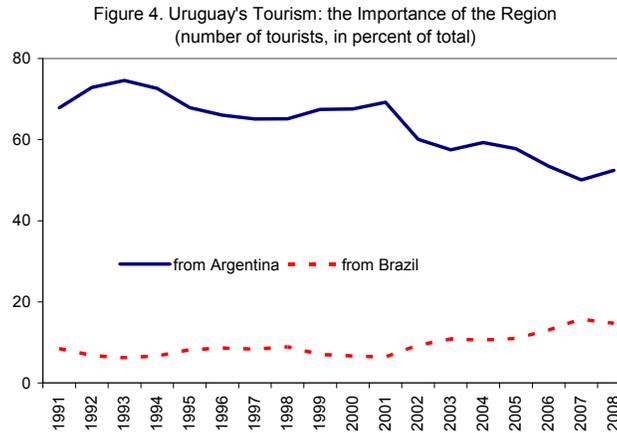
Period	Argentina		Brazil		Rest of the World	
	Exports	Imports	Exports	Imports	Exports	Imports
1961-65	1.3	6.0	2.6	8.8	96.1	85.2
1966-70	2.3	9.3	4.8	12.7	92.9	78.0
1971-75	4.6	14.4	12.6	15.3	82.8	70.3
1976-80	8.3	12.1	17.7	14.3	74.0	73.6
1981-85	9.2	9.4	13.7	16.4	77.1	74.3
1986-90	6.6	14.5	24.0	26.2	69.3	59.2
1991-95	16.7	20.4	24.3	25.1	59.0	54.5
1996-00	15.2	22.2	30.4	20.9	54.4	56.8
2001-05	8.8	24.0	19.2	20.9	72.0	55.0
2006-08	8.7	23.4	15.8	21.3	75.5	55.4

Source: Banco Central del Uruguay

The shares of goods exports underestimate Uruguay's trade dependency on the region—especially on Argentina, given the importance of exports of services, which accounted for about 30 percent of total exports of goods and services on average over the last decade. This is mainly due to a large increase in foreign exchange receipts from tourism, which reached values comparable to those from the main traditional exports—such as beef and wool, with Argentina being by far the most important source of tourism in Uruguay (Figure 4). It is worth noting that, as in the case of goods, the relative importance of Argentina has declined in recent years as the geographical sources of tourism also diversified. In fact, the number of tourists from Argentina as a fraction of total tourists—which reached 70 percent on average

⁵ Uruguay signed two preferential trade agreements with its regional neighbors. The first one was signed with Argentina (CAUCE) in 1974; the second one was signed with Brazil (PEC) in 1975.

during the 1990s—has declined to about 50 percent.⁶ The share of Brazil as a source of tourism in Uruguay has been substantially smaller than that of Argentina (although it has increased in recent years), accounting for less than 10 percent of total tourists on average over the past two decades (Figure 4).



While the concentration of trade within the region makes Uruguay vulnerable to shocks stemming from Argentina and Brazil, the impact of these shocks has been exacerbated by the importance of “regional” goods and services.⁷ These are traded within the region but are largely non-tradable with the rest of the world. In the absence of a regional demand for them, they would be considered non-tradables. In fact, they can be traded within the region either because of the low transportation costs or because of the preferential treatment under which they are traded. An obvious example of the first group is given by the tourism sector (with all its connected activities), with an example of the second group being exports of car parts to Argentina.

The vulnerability to the regional trade partners depends on the composition of trade. As noted by Bevilaqua, Catena and Talvi (2001), the vulnerability to shocks stemming from Argentina and Brazil is higher the higher the proportion of regional goods and services in total trade with those countries. Suppose that there is a large decline in aggregate demand or a large real devaluation in one of the big neighbors. The sudden decline in the neighbor’s demand for Uruguayan exports will differently affect the tradable and regional sectors. On the one hand, exports of tradable goods—for example commodities such as beef, wool or rice—can be relocated in other markets, probably after an adjustment period, perhaps at somewhat lower prices and with possibly higher transportation costs. Thus, a substantial effect in production and employment is not expected in those sectors. On the other hand, exports of regional goods and services, which were previously exported to the neighbor

⁶ Similarly, the share of Argentina in Uruguay’s total receipts from tourism reached almost 70 percent in the 1990s, and has declined to less than 45 percent in recent year

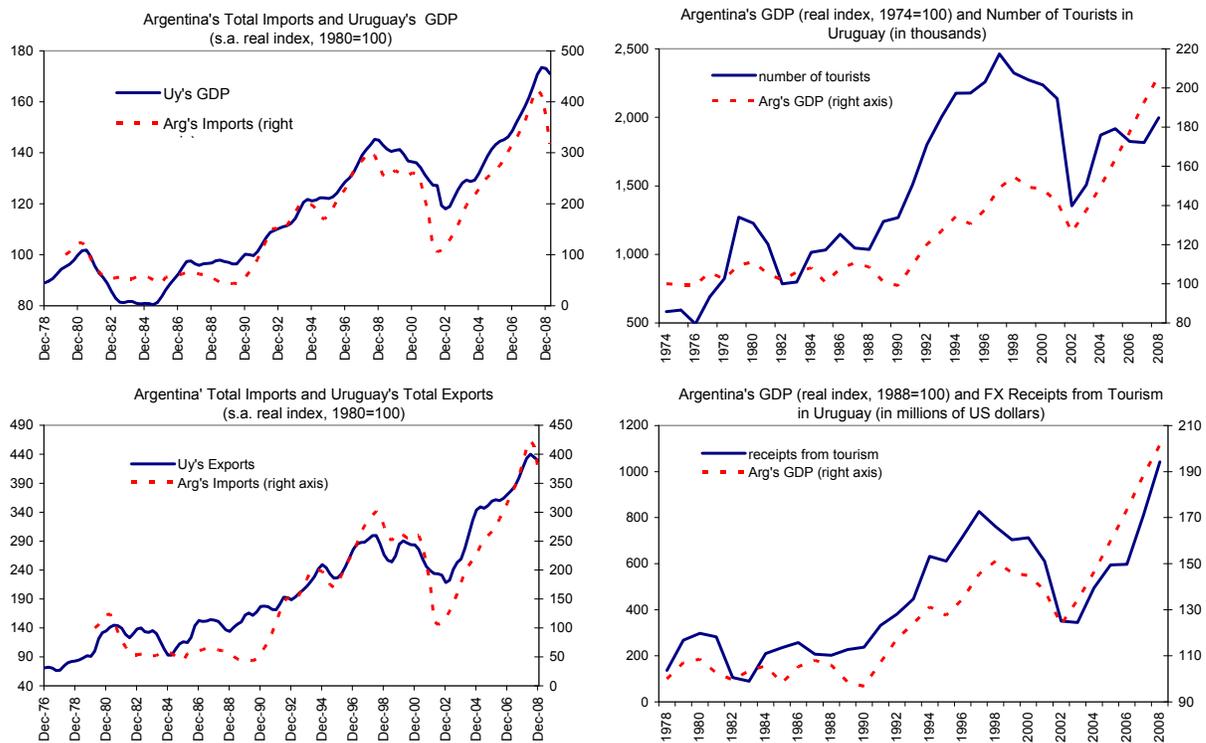
⁷ To our knowledge, the term “regional goods” was coined by Bergara, Dominioni, and Licandro (1994).

country given the special trade regime or the geographical advantages, cannot be relocated in the rest of the world. Hence, the negative regional shock would result in a large decline in output and employment in those sectors.

The share of exports of regional goods in total exports to Argentina has been much larger than the corresponding share for Brazil, which may partially explain the higher vulnerability of Uruguay to shocks originated in Argentina. While tourism and car parts represent the most important export items to Argentina, exports to Brazil consist mainly of agricultural commodities such as cereals—mainly rice—and other grains.⁸ Hence, while the pattern of trade with Argentina is to some extent idiosyncratic given the importance of regional goods, the one with Brazil is more similar to that with the rest of the world.

The strong trade linkages between Argentina and Uruguay are shown in Figure 5. The panel illustrates the high correlation of Argentina's total imports with Uruguay's GDP and exports, and the high correlation of Argentina's GDP with the number of tourists and with foreign exchange receipts from tourism in Uruguay.⁹ The correlations of Brazil's imports with Uruguay's GDP and exports are illustrated in Figure 6.

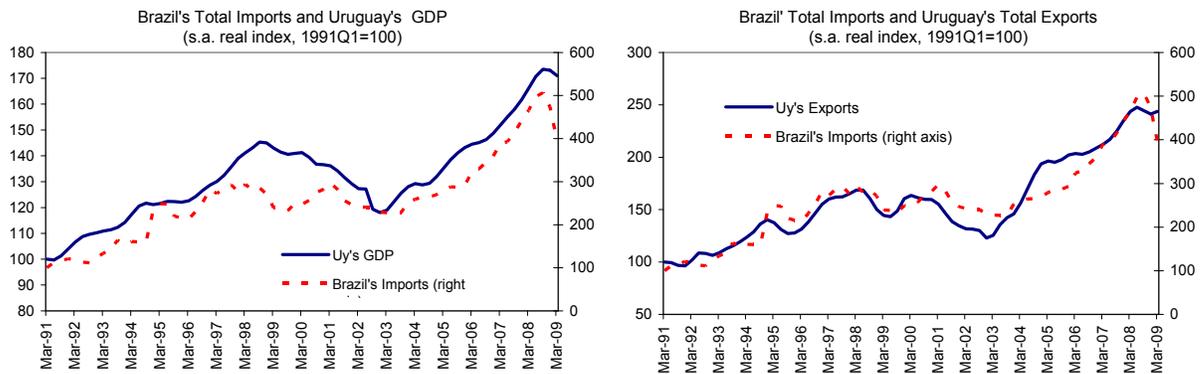
Figure 5. Trade Linkages Between Argentina and Uruguay



⁸ The larger share of regional goods in exports to Argentina has been documented by Bevilaqua, Catena, and Talvi (2001).

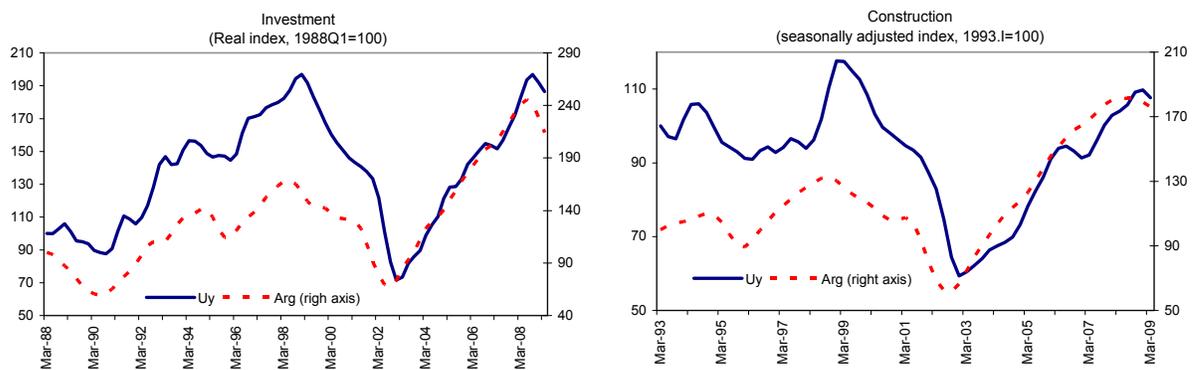
⁹ Previous studies have also emphasized the correlation between Uruguay's output and Argentina's consumption. See, for instance, Masoller (1998) and Eble (2006).

Figure 6. Trade Linkages Between Brazil and Uruguay



In addition to the large flows of trade in goods and services and the high share of trade in regional goods, there are other non-conventional channels through which shocks from Argentina are propagated into Uruguay. These channels include large flows of FDI from Argentina, including flows of real estate investment, mainly through the purchase and construction of houses and buildings in Punta del Este—Uruguay’s main tourist center—and in other cities like Colonia, and through the purchase of large pieces of land—the “estancias”—in Uruguayan territory. In recent years, there has also been a substantial inflow of FDI from Argentina to the agricultural sector. Figure 7 shows the co-movements of the investment cycle and the construction cycle on both sides of the Rio de la Plata.

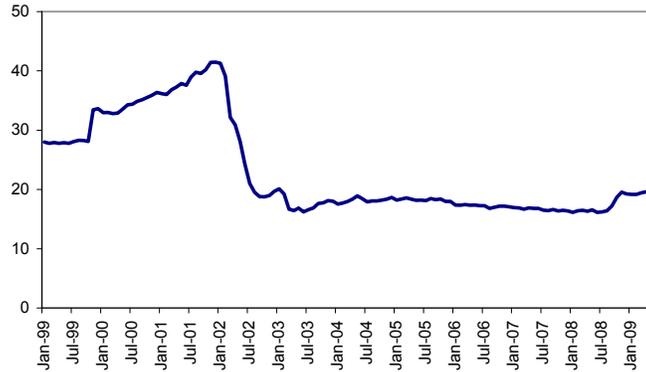
Figure 7. Real Linkages Between Argentina and Uruguay



The potential vulnerabilities to shocks from Argentina are not limited to real linkages. Argentine shocks might have large effects on Uruguay through financial channels as well. The most tight and direct financial linkage is due to the fact that the Uruguayan banking system has been host to Argentine depositors for many years. The magnitude of Argentine deposits in Uruguayan banks used to be quite large during some periods. By the end of 2001—just before the bank-run of 2002—deposits of non-residents (mostly Argentines) accounted for 45 percent of foreign exchange deposits in the Uruguayan banking system, and for 60 percent of foreign exchange deposits in private banks. Although they have recovered

somewhat since September 2008, these figures are much lower today than in the pre-2002 crisis period, at 25 percent and 35 percent respectively. Moreover, non-resident deposits accounted for more than 40 percent of total deposits—in foreign and domestic currency—by end-2001, and that fraction has declined to 20 percent in 2009. (Figure 8).¹⁰

Figure 8. Uruguay: Non-Residents Bank Deposits
(in percent of total deposits)



In sum, we have identified some idiosyncratic linkages between the Uruguayan and the Argentine economies, including: the large flows of trade of goods and services; the large share of trade in regional goods; the large flows of FDI in real estate and the agricultural sector, and the large amount of Argentine deposits in Uruguay’s banking system. The existence of this number of real and financial channels through which shocks from Argentina propagate into Uruguay explains why Uruguay’s business cycle is highly correlated with Argentina’s one, and—notably—more correlated than with that of Brazil, despite the larger importance of the Brazilian market as a destination for Uruguay’s exports.

IV. HOW IMPORTANT ARE REGIONAL FACTORS? AN ECONOMETRIC APPROACH

In this section a standard vector autoregressions (VARs) **model with block exogeneity restrictions** is estimated to quantify the extent of spillovers from external shocks into Uruguay. This empirical approach allows one to determine the relative importance of different regions as sources of disturbances affecting the Uruguayan economy, and to identify the dynamic responses of Uruguay’s output to shocks to foreign GDP growth. A key feature of the model is that external variables are assumed to be completely exogenous to the Uruguayan economy.

¹⁰ Some large Uruguayan banks had been exposed to Argentina from the assets side as well, especially before the 2002 crisis. However, such exposure is negligible today.

A. The Empirical Approach

The structural model can be expressed—omitting the constant terms for simplicity—as:

$$A(L)y_t = \gamma_t$$

where y_t is an n vector of variables, $A(L)$ denotes a lag polynomial matrix, and γ_t is an n vector of structural disturbances or shocks. A_0 , which represents the contemporaneous relationships between the variables of the model, is a non-singular matrix normalized to have ones on the diagonal.

The reduced form corresponding to this structural model can be written as:

$$B(L)y_t = u_t$$

where $B(L)$ is a lag polynomial matrix such that $B(L) = (A_0)^{-1}A(L)$ and $B_0 = I$, and u_t is an n vector of mean zero reduced form disturbances with covariance matrix Γ , such that

$$u_t = (A_0)^{-1}\gamma_t.$$

The VAR includes real GDP in Uruguay, in the region (Argentina and Brazil), and in the rest of the world.¹¹ It may be argued that the importance of the neighbors in driving output fluctuations in Uruguay could be explained by common external shocks—not captured by global GDP growth. Hence, the VAR includes some external factors such as world real interest rates,¹² oil prices, and non-fuel commodity prices.¹³ The model is estimated using quarterly data from 1980Q1 through 2009Q2. All the variables—except the world real

¹¹ The rest of the world's GDP is proxied by global GDP. Times series for categories such as advanced countries or the G-7 are not available for the whole period of analysis. Although Brazil, Argentina, and Uruguay are included in global GDP, it is not likely that they affect the global figure given their small relative size.

¹² Changes in international real interest rates constitute an important factor driving portfolio capital inflows to Latin America, thus influencing business cycles across the region (Calvo, Leiderman, and Reinhart, 1993, and Calvo, Fernandez Arias, Reinhart, and Talvi, 2001). This link between international interest rates and capital flows to Latin America may be a consequence of a number of reasons. Low interest rates in mature markets may lead investors in those markets to seek higher returns in other markets, increasing the demand for emerging market assets. Not only does external financing become more abundant for emerging markets, but also the cost of borrowing declines as a consequence of the lower interest rates in the U.S. In fact, Fernandez Arias (1996) shows that country-risk premia in emerging markets is indeed affected by international interest rates, amplifying the interest rate cycles in mature markets.

¹³ The world real interest rate is computed using the six-month LIBOR and the CPI inflation rate of industrial countries. Oil prices are measured as the average of three crude oil spot prices (Dated Brent, WTI, and Dubai Fateh), in U.S. dollars per barrel. Non-fuel commodity prices are measured by the corresponding WEO Index, which includes Food and Beverages and Industrial Inputs Price Indices.

interest rate—are expressed in log levels, and the model is estimated in first differences,¹⁴ with one lag.¹⁵

In order to identify the structural parameters of the model, a set of restrictions must be specified. The reduced form errors are orthogonalized by standard Choleski decomposition. The selected Choleski ordering is characterized by the idea that the more exogenous variables of the model precede the endogenous ones. Hence, the selected order is as follows: first, the global variables (rest of the world's GDP, world real interest rates, and oil and non-fuel commodity prices); second, the regional variables (Brazil's and Argentina's GDP); and finally, Uruguay's output.¹⁶ This implies that global and regional factors do not respond instantly to changes in Uruguay's GDP, but the latter may be affected by contemporaneous changes in external conditions.

However, the restrictions implied by Choleski ordering refer only to the contemporaneous relationships between the variables of the model. To assume complete exogeneity of the external variables, lagged values of Uruguay's output should not affect them either. This is achieved by imposing block exogeneity restrictions. Therefore, the model is separated in three blocks of equations: two external blocks—one including global factors and the other including regional variables—and one block with Uruguay's GDP. Since Uruguay's output is completely absent from equations in the external blocks, shocks to it cannot affect, neither contemporaneously nor with any lags, the external variables.

The block exogeneity restrictions are summarized in Table 5. Each row indicates whether dependent variables of equations in a certain block are affected by dependent variables of other blocks. Each column indicates whether dependent variables of equations of a particular block appear as regressors in any equation corresponding to another block. Thus, Uruguay's GDP does not appear in equations of either the global or the regional block. Regional variables do not appear as regressors in the global block, whereas global factors do appear as regressors in the regional block. Finally, both global and regional variables enter Uruguay's equation as explanatory variables.

¹⁴ Standard unit root tests (augmented Dickey-Fuller) show that all variables are stationary in first differences. In addition, most cointegration tests suggest that the variables in the model are not cointegrated (i.e., the null hypothesis of no cointegration cannot be rejected). Hence, it seems adequate to estimate the model in first differences.

¹⁵ The lag length was selected according to the Schwarz information criterion. The Akaike Information Criterion (AIC) suggested four lags instead of one. The VAR was also estimated using four lags and the results do not change significantly.

¹⁶ The estimation results are robust to different orderings of endogenous variables.

Table 5. Block Exogeneity Restrictions of the VAR Model

	Independent Block		
	Global	Regional	Uruguay
Dependent Block			
Global	✓		
Regional	✓	✓	
Uruguay	✓	✓	✓

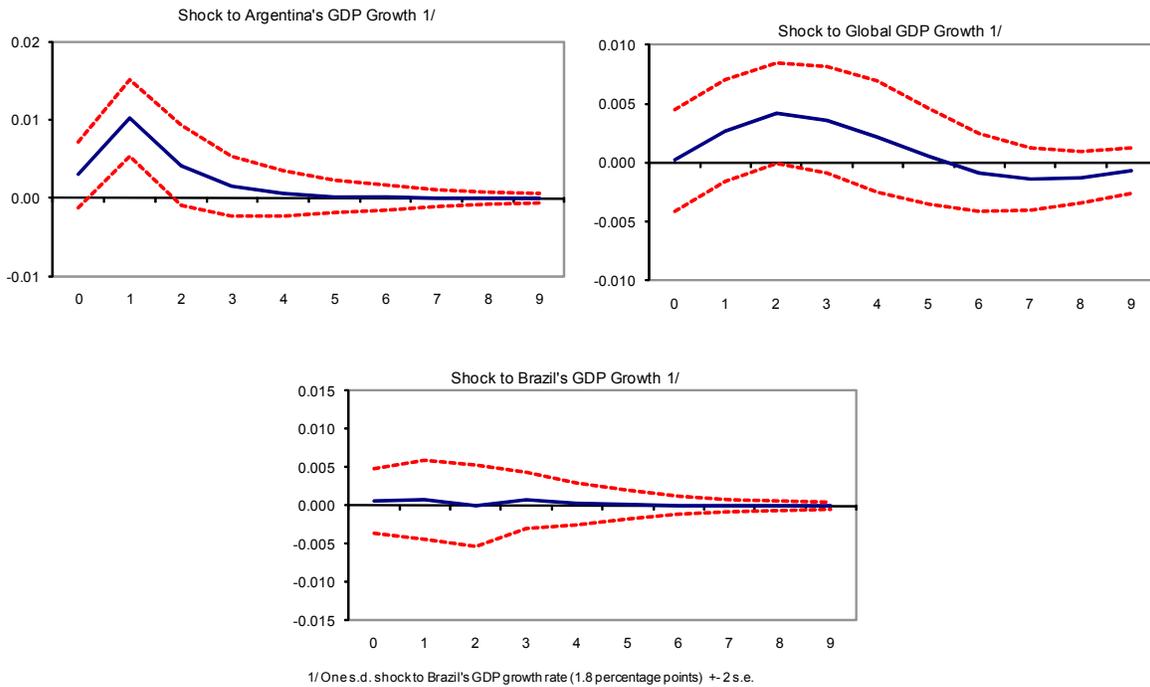
The block exogeneity approach implies that some of the VAR equations have regressors not included in others. This type of model is known as “near-VAR” in the literature. The block exogeneity procedure reduces the number of parameters to be estimated, which helps to limit the erosion of degrees of freedom and to improve the efficiency of the estimation. Standard VAR models may be estimated by Ordinary Least Squares (OLS). However, when some of the equations in a VAR present regressors not included in others, Seemingly Unrelated Regressions (SUR) appear to provide more efficient estimates of the coefficients than OLS. The efficiency gains are larger the higher the correlation of the residuals across equations. Thus, in this paper the system is estimated using SUR rather than OLS.

B. Estimation Results

The main objectives of this section are achieved through two standard tools of VAR analysis: impulse response functions and variance decomposition. Impulse responses constitute a practical way to identify the dynamic responses of the Uruguayan economy to external shocks, illustrating how growth in Uruguay has tended to react to shocks to growth in Brazil, Argentina and the rest of the world. Variance decomposition, in turn, provides a quantification of the relative importance of these regions as sources of shocks affecting output fluctuations in Uruguay.

Shocks to Argentina’s GDP growth appear to have quite large and rapid effects on Uruguayan GDP. Figure 9 shows the dynamic response of Uruguay’s GDP growth to a one standard deviation positive shock to Argentina’s growth: output increases on impact, with a lasting effect of about four quarters, and the largest response occurs only one quarter after the shock. A “rule of thumb” elasticity can be derived from the impulse response, which indicates that a 1 percentage point increase in Argentina’s GDP growth leads to an increase in Uruguay’s GDP growth of $\frac{1}{2}$ percentage points after one quarter. A positive shock to global GDP growth is also expansionary, with the largest impact felt two to three quarters after the shock. In contrast, a one-standard deviation shock to GDP growth in Brazil has a negligible and statistically insignificant impact on Uruguay. This is very interesting, given the large share of Brazil in Uruguay’s trade. As discussed in the previous section, this may be partly explained by the composition of trade.

Figure 9. Dynamic Response of Uruguay's GDP Growth



Variance decomposition analysis also underscores the key role played by Argentina in driving output fluctuations in Uruguay (Table 6). Spillovers from Argentina account for more than 20 percent of Uruguay's output fluctuations.¹⁷ While shocks to global GDP growth explain about 8 percent of GDP fluctuations, spillovers from Brazil appear to be insignificant.

Table 6. Variance Decomposition of Uruguay's Real GDP Growth (in percent)

Horizon (quarters)	Standard Error	Global GDP	World Real Int.Rates	Oil Prices	Non-fuel Comm. Prices	Brazil's GDP	Argentina's GDP	Uruguay's GDP
1	0.0200	0.01	0.16	0.11	0.63	0.10	2.30	96.69
4	0.0244	6.44	3.90	1.73	0.55	0.25	22.47	64.67
8	0.0249	7.48	4.60	2.07	1.57	0.25	21.73	62.31

The residuals from the VAR model illustrate the volatility of output shocks, and the degree to which they are correlated with disturbances in other regions (Table 7). The most striking fact is the high volatility of output shocks in the region, which are about 10 times more volatile than shocks to global GDP growth. This may reflect the high degree of domestic macroeconomic volatility, especially in Argentina and Uruguay—which both suffered severe economic and financial crises during the period of analysis, in which real output declined dramatically. In addition, the correlation and covariance of Uruguayan domestic shocks with impulses in Argentina is approximately four times as large as with those in Brazil.

¹⁷ For a horizon of eight quarters, which is when the percentages stabilize.

Table 7. Correlations, Covariances and Standard Deviations of VAR Residuals

		Global	Brazil	Argentina Covariance	Uruguay	Stand. dev. of domestic shock
Global	Correlation		0.000002	0.000001	0.000000	0.002
Brazil		0.060		0.000013	0.00001	0.019
Argentina		0.020	0.030		0.00006	0.023
Uruguay		0.011	0.027	0.126		0.020

V. HOW VULNERABLE IS URUGUAY TO A CRISIS IN THE REGION? A CASE STUDY APPROACH

A. Crisis Episodes in the Region: A Closer Look

The stylized facts described in the previous sections illustrate the high vulnerability of the Uruguayan economy to spillovers from Argentina. The idiosyncratic and strong economic linkages and the documented high correlation between the business cycles in these countries contribute to the common belief that an economic and financial collapse in Argentina would necessarily trigger a crisis in Uruguay.

The 1981-82 and 2001 crises in Argentina

Moreover, this belief seems to be true if we observe what happened after the early 1980s and the 2001 crises in Argentina. These Argentine crises were followed by the two largest financial crises in recent Uruguayan economic history: the “Tablita” crisis in 1982 and the more recent one in 2002. In the 1982 crisis, GDP fell by a cumulative 10 percent in Argentina and by 20 percent in Uruguay; during the 2002 crisis, those numbers were 20 percent and 23 percent respectively (Figure 10). The large real exchange rate depreciations in Uruguay in these two episodes (100 percent in 1982 and 75 percent in 2002) followed even larger real exchange rate depreciations in Argentina (Figure 11). In both crises, the Uruguayan banking system suffered a dramatic bank run, and in both cases Argentina was facing a simultaneous banking crisis of its own. The bank runs in Uruguay were characterized by sudden and abrupt withdrawals of deposits by both residents and non-residents (mainly Argentines). Foreign exchange deposits from non-residents fell by about 50 percent whereas those from residents fell by 40 percent in the “Tablita” crisis; during the 2002 crisis the declines amounted to 65 percent and 30 percent respectively (Figure 12).

However, these facts do not necessarily mean that any financial crisis in Argentina would inevitably cause a financial crisis in Uruguay. The occurrence of simultaneous crises in both sides of the Rio de la Plata might have been explained, at least partially, by some common external shock. The international finance literature has argued that the bunching of sudden stops in capital inflows and financial crises during the late 1990s suggests that a common external element may be at least partially responsible for those crises. This literature has pointed out that countries with quite different macroeconomic fundamentals—and in some cases countries with little trading and financial links—were affected at about the same time.

For instance, Calvo, Izquierdo and Talvi (2003) argue that “developments at the center of capital markets were key to producing an unexpected, severe, and prolonged stop in capital flows to emerging market economies, and Latin America was no exception.”

Figure 10. Crisis Episodes in the Rio de la Plata: Economic Activity

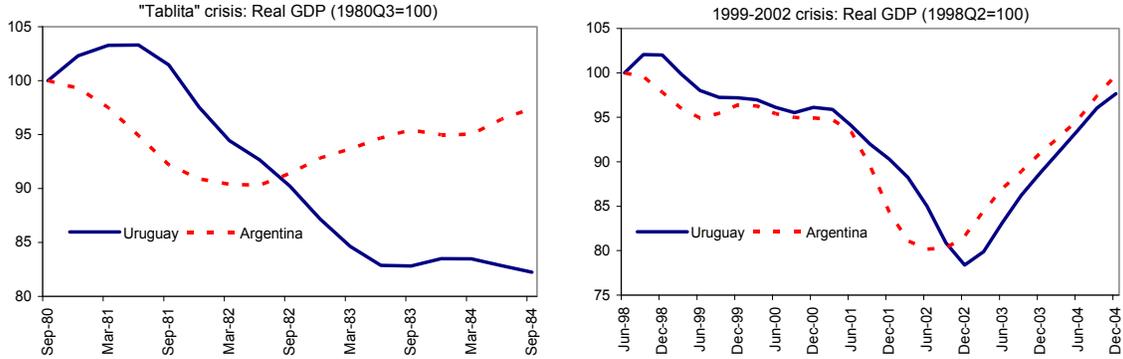


Figure 11. Crisis Episodes in the Rio de la Plata: the Real Exchange Rate

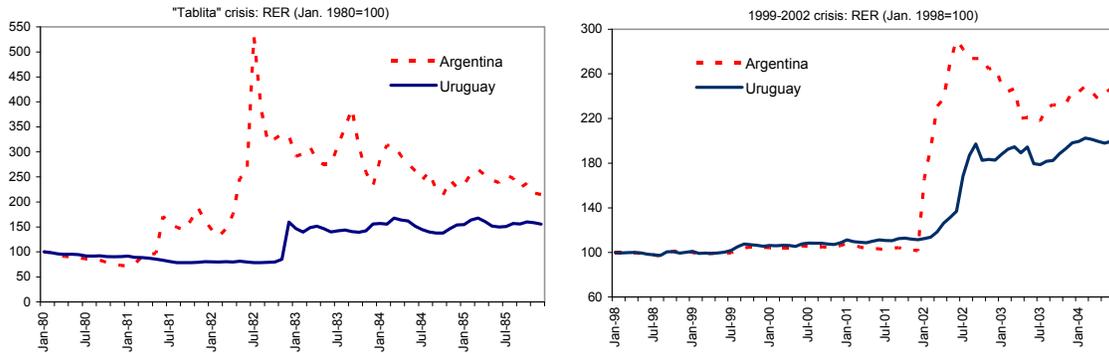
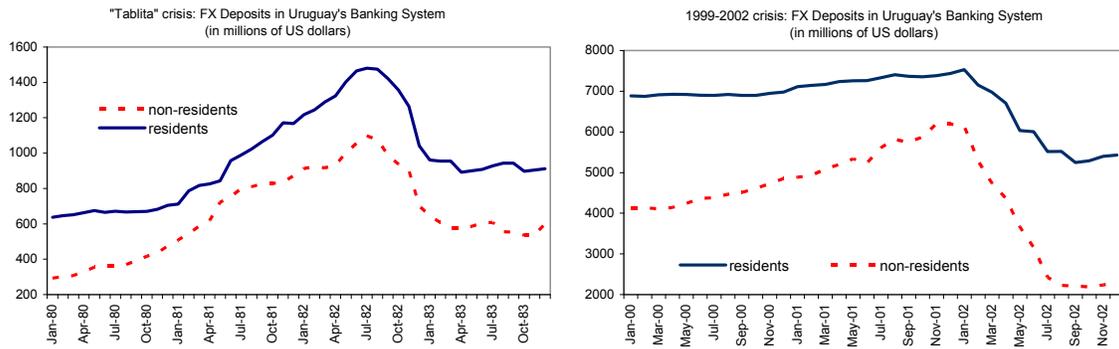


Figure 12. Crisis Episodes in the Rio de la Plata: Bank Deposits



During those crisis episodes in Argentina and Uruguay, most Latin American countries were actually affected by systemic shocks associated with disruptions in international financial markets that occurred in 1982 after the Mexican default and after the Russian crisis in August 1998. These disruptions brought large synchronized increases in the cost of external financing for Latin American countries and large reversals in capital inflows to the region. The tightening of international financial conditions led to sharp current account adjustments and large real exchange rate depreciations in Latin America, accompanied by severe contractions of investment and sharp reductions of economic growth (see Appendix).

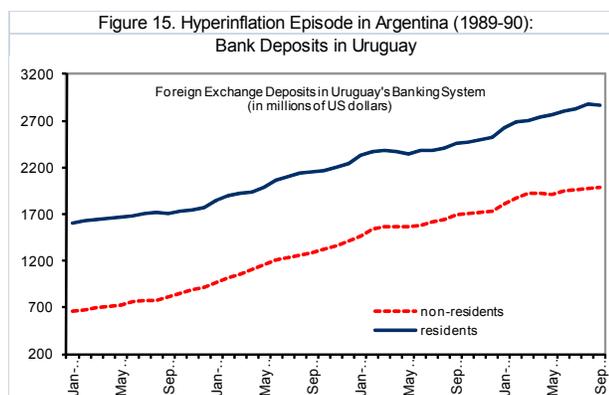
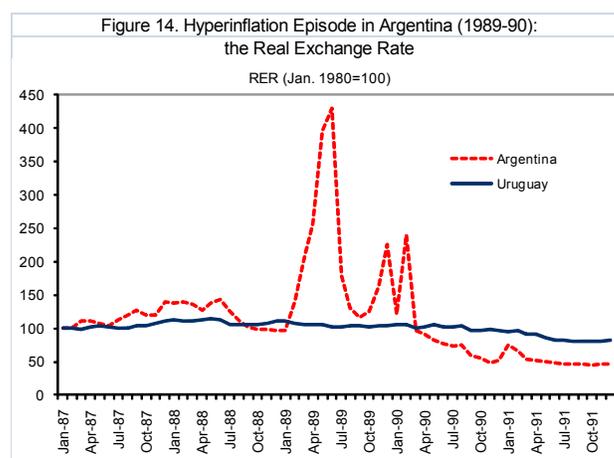
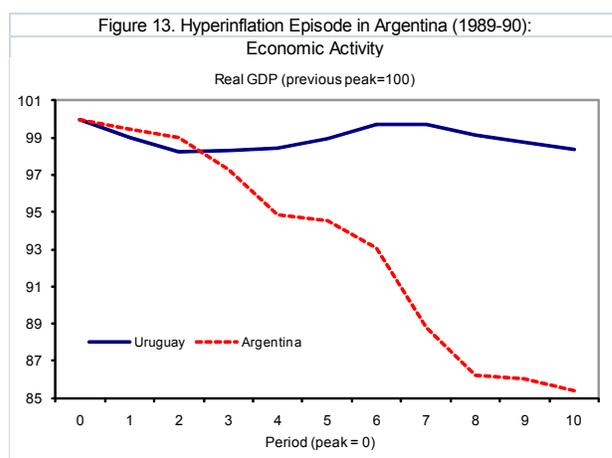
Argentina not only suffered a similar pattern of macroeconomic adjustment but also experienced major financial crises and economic collapses with severe social consequences. This is partially due to the fact that the external shock was combined with certain domestic financial vulnerabilities that acted as amplifiers of the external financial shocks, in particular the high level of liability dollarization in both the private and public sector, which implied large currency mismatches in the balance sheets of households, firms and the government. As noted by Calvo, Izquierdo and Talvi (2003), the large and permanent required adjustment in the real exchange rate caused huge balance sheet problems in the non-tradable sector—both in the public and private sector—which affected the asset side of the banking sector and led to fiscal sustainability problems. The final consequence of this sequence of events was a deep triple crisis: banking, currency and debt crises.

The economic disruptions in Uruguay were especially strong because of the additional contagion effect caused by the financial crisis in Argentina.¹⁸ That is, the effects of the external financial shock—which affected most countries in Latin America—were exacerbated by the specific negative shock stemming from Argentina and transmitted through the idiosyncratic linkages analyzed before. Financial linkages—mainly due to the large amount of deposits from Argentines in Uruguayan banks—constituted a key channel of transmission, as was evident in the 2002 crisis. Initially, as the crisis deepened in Argentina, capital outflows from this country sought refuge in the Uruguayan banking system. But later on, when the Argentine authorities declared a freeze on bank deposits (the “Corralito”) in December 2001, Argentine firms and households—facing strong liquidity constraints—began to withdraw their deposits kept at Uruguayan banks. The withdrawals escalated and became a run on deposits amid fears that the Uruguayan central bank could either run out of reserves or (like Argentina) confiscate the deposits and also concerns about the health of some large private banks with large exposure to Argentine assets. The abandonment of the peg and the default in Argentina also contributed to the contagion effects given fears of similar measures in Uruguay.

¹⁸ Uruguay also had some domestic vulnerabilities that exacerbated the impact of the external shock, in particular the high level of financial dollarization and large currency mismatches both in the public and private sectors.

The 1989-90 hyperinflation and financial crisis in Argentina

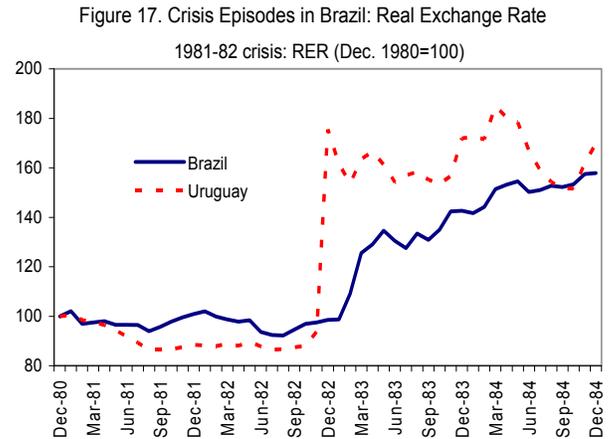
One interesting laboratory experiment—a case of a pure idiosyncratic Argentine shock—is provided by the hyperinflation episode in Argentina, in 1989–90. During this crisis Argentina suffered a large decline in economic activity, a sharp real currency devaluation, hyperinflation and a banking crisis that ended in a freezing of deposits. This is an interesting case study because even though Argentina experienced a major financial crisis and economic collapse with severe social consequences, the Uruguayan economy did not face any major disruption: economic activity declined only slightly, the real exchange rate did not depreciate and there were no withdrawals of deposits from the Uruguayan banking sector—in fact deposits increased due to a large inflow of Argentine deposits seeking safety (Figures 13 to 15). Notably, this major financial crisis and economic collapse in Argentina was not accompanied by a corresponding collapse in Uruguay, even though the Uruguayan economic fundamentals in that moment were much more fragile than before the 1999–2002 crisis.¹⁹



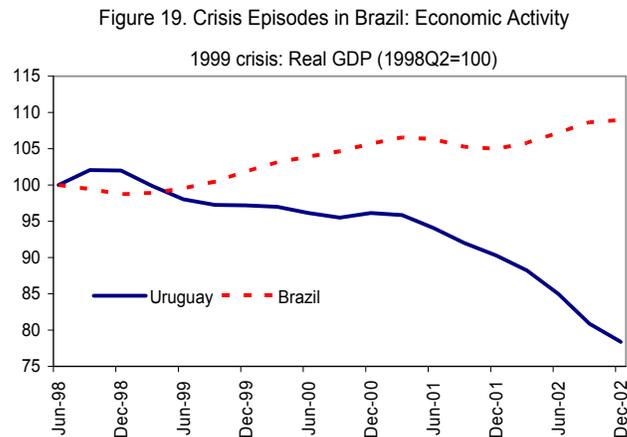
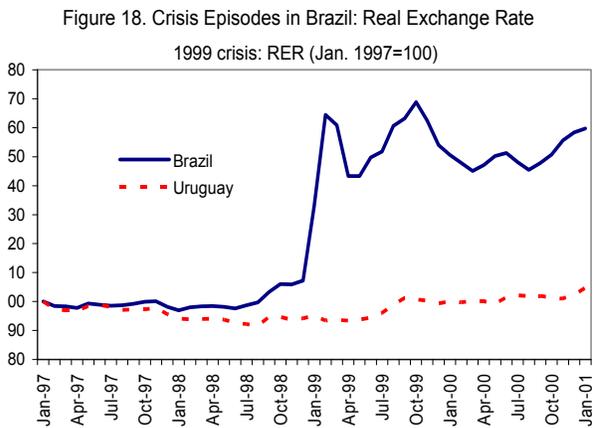
¹⁹ Uruguay's annual inflation rate was 80 percent and 113 percent in 1989 and 1990 respectively, much higher than in 1998 and 1999, where inflation rates were 11 percent and 6 percent respectively; the fiscal deficit represented 7.4 percent of GDP in 1989 and only 0.9 percent in 1998; the public debt-GDP ratio was 64 percent in 1989 and only 36 percent in 1998.

Crisis Episodes in Brazil

Episodes of economic and financial turbulence in Brazil may have also been a source of turmoil in Uruguay. Two major episodes can be identified in Brazil: the 1981–82 crisis, and the 1999 currency crisis. Although the crisis in the early 1980s was accompanied by a simultaneous crisis in Uruguay (Figure 16), it is hard to argue that Uruguay’s crisis was largely a consequence of Brazil’s one. As discussed before, this was mainly a systemic financial crisis affecting most Latin American countries following the Mexican default. In fact, the large real exchange rate devaluation in Uruguay actually preceded the one in Brazil (Figure 17).



The large devaluation of the real in 1999 provides another case of a negative shock to the Uruguayan economy stemming from Brazil. As noted earlier, this hardly constitutes a Brazilian idiosyncratic shock, as most countries in Latin America were actually affected by a common negative external shock. In any case, the sharp real exchange rate depreciation in Brazil was not followed by a depreciation in Uruguay (Figure 18), and—although it negatively affected economic activity and exports in Uruguay—did not cause a collapse of output, as did the contagion effects from the Argentine crisis a few years later (Figure 19).



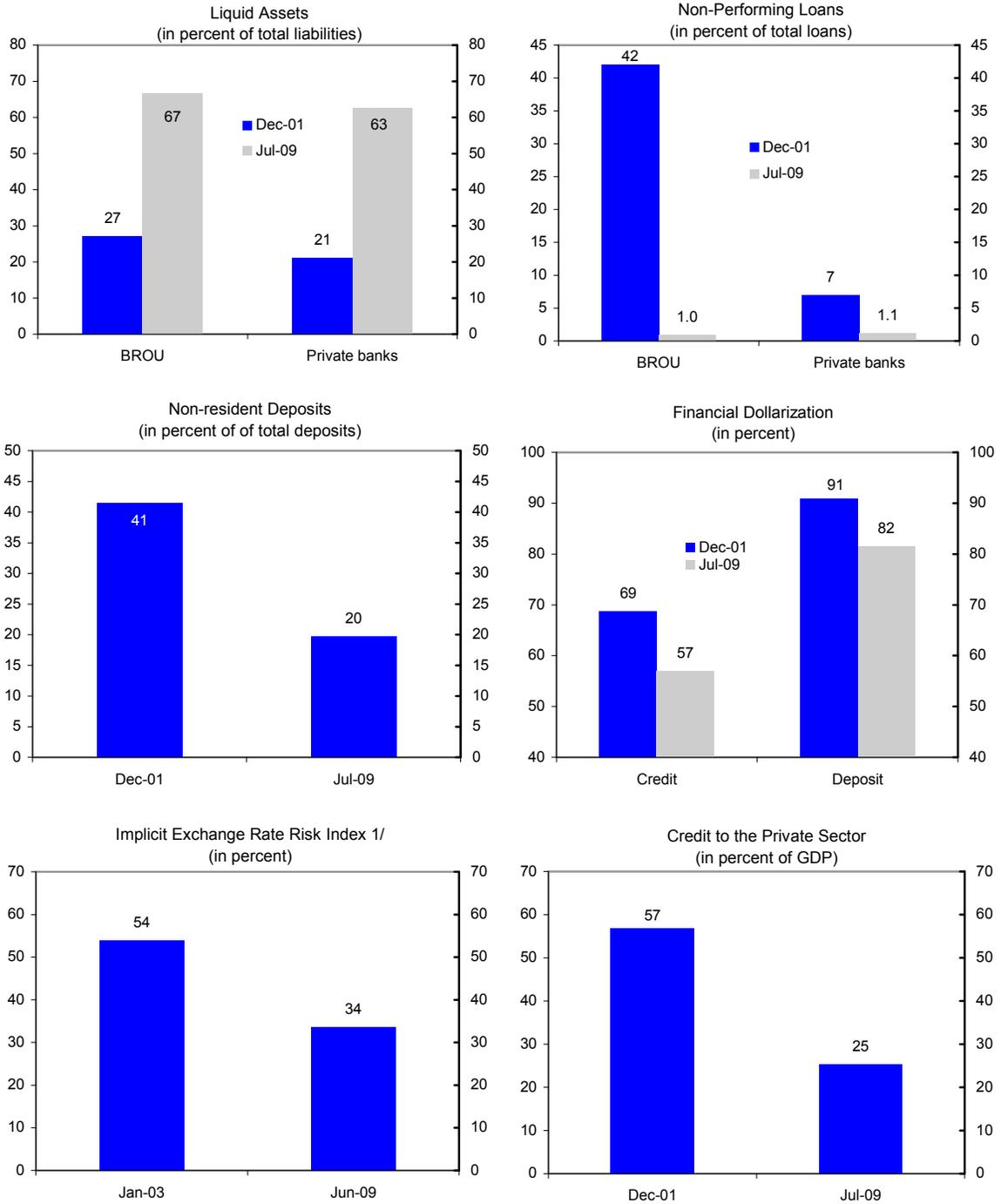
B. How Vulnerable is Uruguay Today to Disruptions in the Region?

Given the strong influence of regional developments, the question about the vulnerability of the Uruguayan economy to disruptions in the region remains. However, while adverse effects on Uruguay—mainly through real channels—would be unavoidable, a crisis in Uruguay is unlikely:

- The Uruguayan economy entered the current global crisis better prepared than in the past. Improved macroeconomic fundamentals include single digit inflation, substantial international reserves, low external current account deficits more than financed by record-high FDI levels, skillful debt management, and a more flexible exchange rate regime.
- The exposure of Uruguayan banks to Argentina is significantly lower than in the past. In the aftermath of the 2002 crisis, the regulation and supervision of the financial system have improved significantly and the authorities have taken measures to internalize credit risks from dollarization and cross-border activities. Non-resident deposits (mainly Argentine), which accounted for more than 40 percent of total deposits by end-2001, represent only 20 percent today. Moreover, while major Uruguayan banks used to be heavily exposed to Argentine assets in the past, this type of exposure is currently relatively small.
- Uruguay's banks are substantially healthier than during past episodes of crisis in Argentina. Banks are very liquid and well-capitalized, and the level of non-performing loans is very low (1 percent of total loans). This partly reflects the significant downsizing of the banking system after the 2002 crisis; a consolidation process that reduced the number of banks in the system. Moreover, credit and deposit dollarization have declined significantly, and currency mismatches in households and corporates' balance sheets have also declined substantially (Figure 20).²⁰
- A significant diversification of export destinations has occurred in recent years, reducing the vulnerability to the region, especially to Argentina. In fact, the concentration of Uruguayan trade (not only in goods but also in services) in Argentina has declined substantially. While exports to Argentina represented more than 15 percent of total exports of goods in the 1990s, they accounted for only 8 percent on average since 2001. Moreover, tourism receipts from Argentines—which explained almost 70 percent of Uruguay's total receipts from tourism in the 1990s have declined to less than 45 percent. The share of Brazil in Uruguay's exports has also fallen, with non-regional destinations becoming increasingly relevant.

²⁰ The implicit exchange rate risk index, measured as foreign currency credit to the non-tradable sector as a percentage of total credit, has declined from 55 percent in 2003 to below 35 percent in 2009.

Figure 20. Uruguay. Banking System Soundness Indicators



1/ Foreign currency credit to the non-tradable sector as a percentage of total credit

VI. FINAL REMARKS

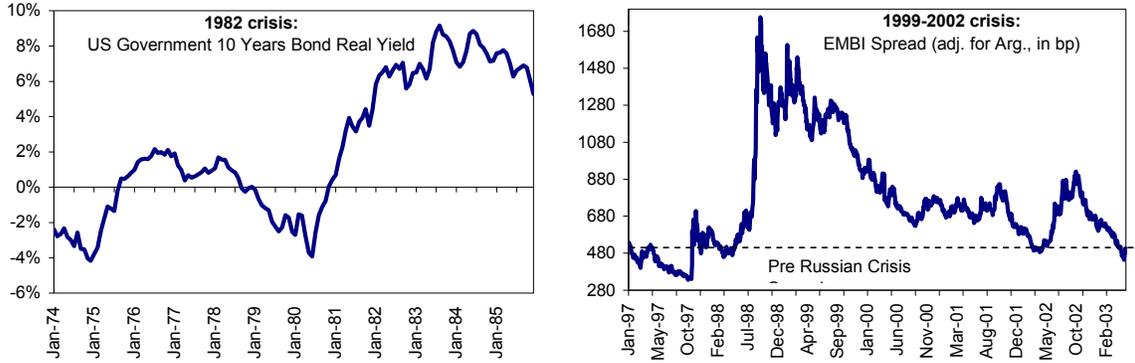
How important are regional factors for Uruguay? This paper shows that Uruguay has been very sensitive to changes in regional conditions, especially to developments in Argentina. Shocks stemming from Argentina—which account for about 20 percent of output fluctuations in Uruguay—tend to have large and rapid effects on Uruguay’s GDP growth. This is mainly due to the existence of some idiosyncratic real and financial linkages between Uruguay and Argentina that also explain the very high correlation between business cycles in these two countries. Thus, it may be argued that—to some extent—Argentina constitutes a second “rest of the world” for Uruguay; a source of shocks that are of different nature, and are transmitted through different channels than traditional external shocks.

How vulnerable is Uruguay today to a potential crisis in one of its neighbor countries? The analysis of previous crisis episodes in the region suggests that despite the importance of the strong linkages, and even observing that the two largest financial and economic crises in recent Uruguayan history followed deep crises in Argentina, a potential new crisis in the region—although it would negatively affect Uruguay through real channels—is not likely to trigger a corresponding crisis in Uruguay this time around.

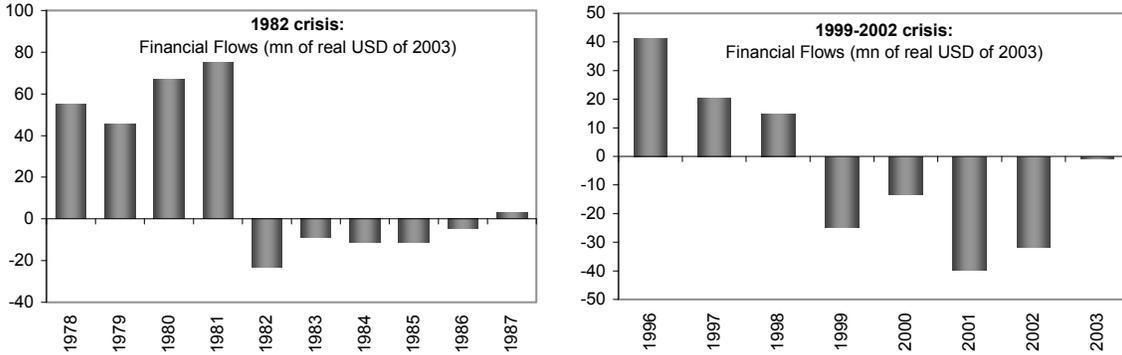
APPENDIX

Figure A1. External Shocks and Macroeconomic Adjustment in Latin America

Cost of External Financing for Emerging Markets



External Financial Flows to Latin America



Current Account Adjustment in Latin America

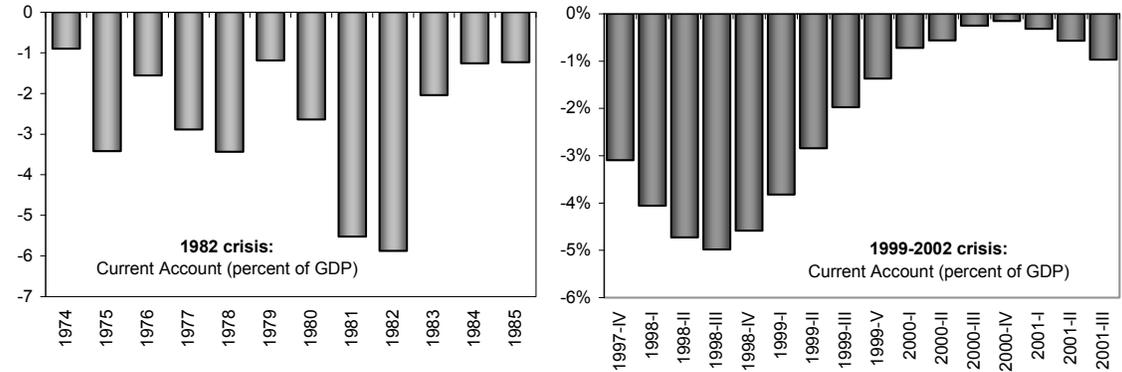
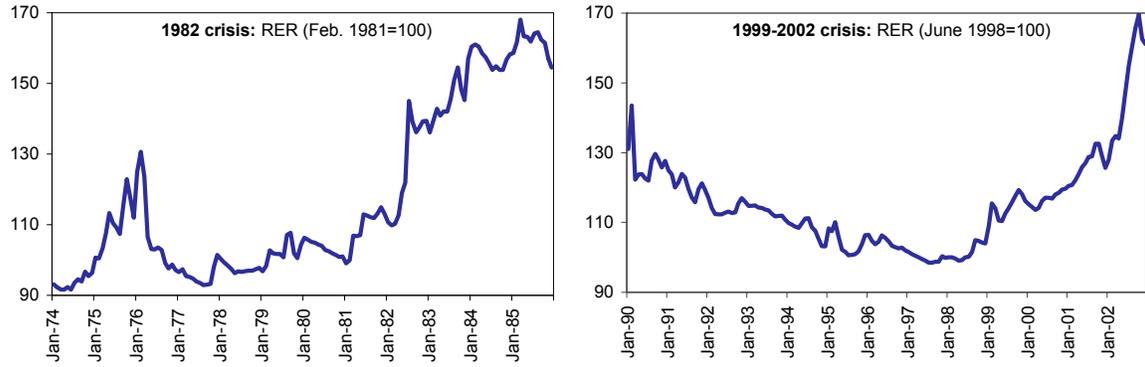
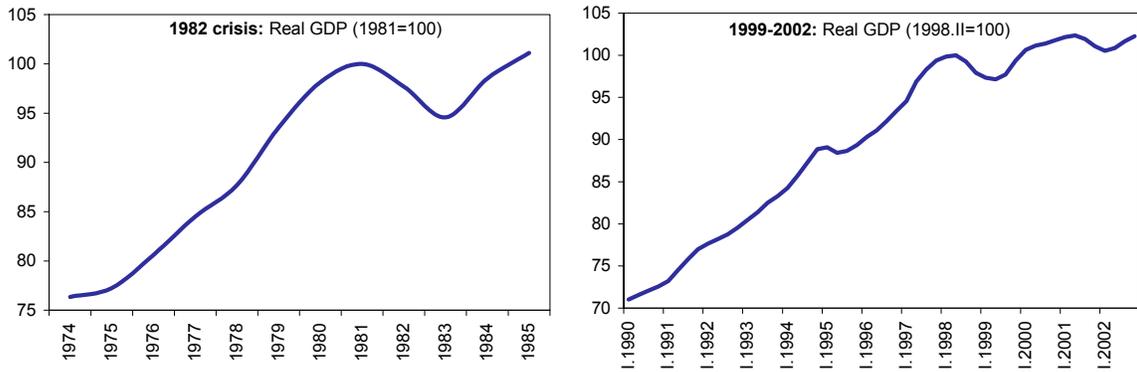


Figure A1. External Shocks and Macroeconomic Adjustment in Latin America (cont.)

Real Exchange Rate Adjustment in Latin America



Economic Activity in Latin America



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