

Uruguay: Selected Issues

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URUGUAY

Selected Issues

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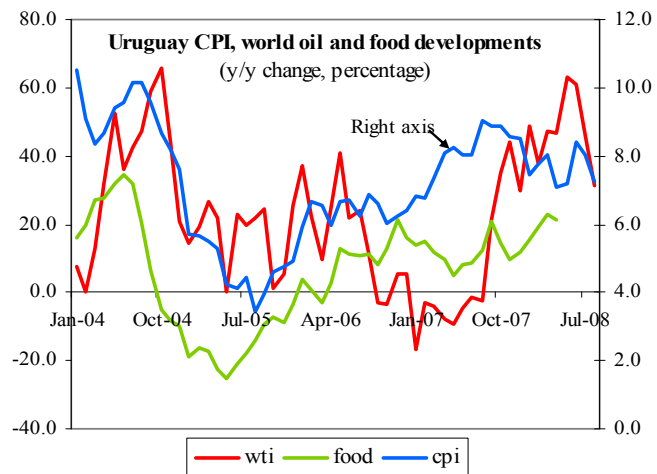
October 9, 2008

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I. COMMODITY PRICES: THEIR IMPACT ON INFLATION IN URUGUAY¹

1. **As in many other countries around the world, the recent surge in commodity prices has contributed to pushing up prices in Uruguay.** This has coincided with domestic demand pressures associated with strong consumption and investment growth. For policy purposes it is, however, important to be able to disentangle the relative magnitude of these two forces: while domestic overheating clearly requires a contractive policy response, in the case of external price shocks the challenge for monetary policy is to limit second-round effects. In this context, it is necessary to assess the magnitude of such second-round effects.

2. **This paper seeks to quantify the importance of international food and oil price inflation for Uruguayan inflation and to draw some international comparisons.** We employ both VAR and Phillips-curve estimations techniques to address these questions. Moreover, we carry out similar estimations for a broader set of emerging markets to put the Uruguayan results into an international context. We also examine spillovers from commodity price increases to measures of core inflation.



3. **We find that world food prices have had a strong but stable impact on Uruguay's inflation.** A 10 percentage point increase in world food prices raises domestic CPI inflation by about 1.2 percentage points after a full year. This implies that about 2-2½ percentage points of current inflation can be attributed to world food price increases. This pass-through is in the upper range of those found for other emerging markets. Second-round effects are also considerable, as there has been a sizeable spillover from world food price increases to different measures of core inflation. An appreciating currency has, however, helped dampen the effects on domestic prices. The impact of world fuel price increases on headline inflation could, however, not be statistically confirmed.

4. **Over a longer time horizon, however, commodity prices explain only a moderate fraction of the total variation in headline inflation in Uruguay.** The variance decomposition suggests that in the last 10 years, variations in world food and oil prices have contributed only about 15-20 percent of the variation in total inflation. Aside from inertia and

¹ This paper was prepared by Rita Babihuga and Gaston Gelos.

other factors not captured by the model, exchange rate changes explain nearly a third of the variation in headline inflation.

A. Evidence From Phillips-Curve Estimations

5. **As a first way of assessing the impact of commodity prices on domestic inflation dynamics, we estimate an augmented Phillips-curve.** Estimating a Phillips-curve allows for assessing the impact of commodity shocks while controlling for other factors such as demand pressures and exchange rate pressures. The approach is similar in spirit as Hooker (2002) and De Gregorio, Landerretche, and Neilson (2008). The estimation uses quarterly data on CPI inflation, with lags of inflation, the unemployment rate gap (as a commonly used proxy of the output gap) and the nominal effective exchange rate as well as changes in the peso price of world fuel and food prices as explanatory variables:

$$(1) \pi_t = \alpha + \delta \cdot \sum_{i=1}^2 \pi_{t-i} + \phi \cdot \sum_{i=0}^2 unempl + \gamma \cdot NEER + \theta \cdot World_oil + \vartheta \cdot World_food + \varepsilon_t$$

6. **Results show a stable impact of food prices on CPI inflation.** The fit of the estimation is good; all coefficients have their expected signs and are significant, with the exception of world fuel prices. The coefficient on world food prices of around 0.05 suggests that a 10 percentage point increase in world food prices is associated with an immediate 0.5 percentage point increase in domestic CPI inflation. The overall importance of world food prices in explaining the variation of total inflation within the sample is, however, small. The pass-through of oil prices has been reported to be low for other developing countries (see, for example, Deutsche Bank, 2008, and Duma, 2008). For a larger set of countries, De Gregorio, Landerretche, and Neilson (2008) find a declining pass-through, which stabilizes at around 0.015.

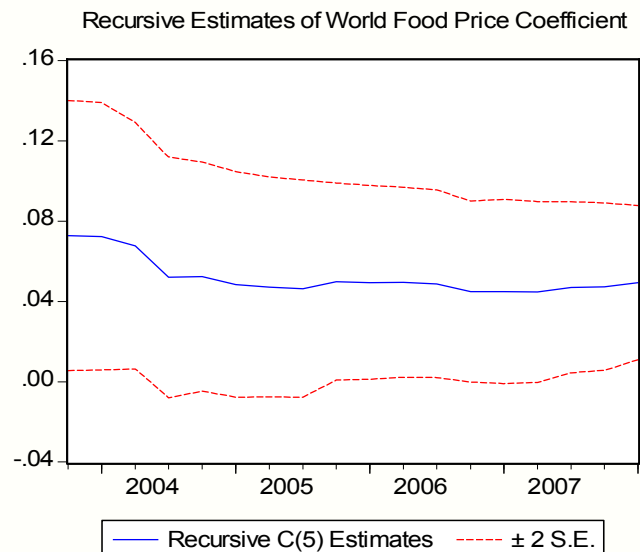


Table 1. Phillips Curve Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Crisis Dummy	1.706	0.572	2.981	0.0058
Inflation (-1)	0.419	0.050	8.350	0.0000
Inflation (-2)	-0.067	0.075	-0.899	0.3763
World Fuel Prices	-0.008	0.011	-0.695	0.4925
World Food Prices	0.049	0.021	2.356	0.0254
Unemployment Gap	0.362	0.181	1.994	0.0556
Unemployment Gap(-1)	-0.905	0.214	-4.235	0.0002
Unemployment Gap (-2)	0.457	0.129	3.542	0.0014
NEER	-0.100	0.022	-4.362	0.0001
Adjusted R-squared	0.873	S.D. dependent var		1.819
Log likelihood	-33.21	Durbin-Watson stat		2.156

Note: Dependent variable: headline inflation. Sample covers 1998 Q1-2008 Q1, with 41 observations. Crisis dummy is a dummy which is equal to one during the 2002-03 crisis. Includes quarterly dummies. Reported standard errors are adjusted to correct for heteroskedasticity and serial correlation (Newey-West).

7. **We also estimate hybrid Phillips-curves with forward- and backward looking expectations, obtaining less stable estimates.** To proxy for inflation expectations, we use annual inflation expectations from Consensus Forecasts.² These expectations are available monthly, but only for end-of-year inflation, and we proxy 12-month ahead expectations by appropriately weighting expected current and next-year inflation for each month. To address the potential problem of endogeneity we estimate the equation with the generalized method of moments (GMM). The coefficient on food prices turns out to be rather unstable, while the one on fuel prices is around 0.01 (a 10 percentage point increase in world fuel prices would be associated with a 0.1 percent rise in headline inflation).

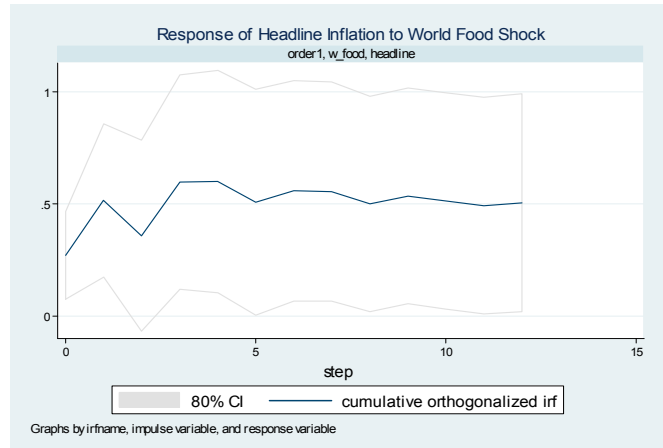
B. Evidence From Vector Autoregressions

8. **To assess the impact of external and domestic shocks over time, we estimate a vector autoregressive model (VAR).** This method allows to control for factors such as economic activity or exchange rate movements in a dynamic setting when examining the impact of commodity prices on inflation. The approach is similar to several recent studies (see, for example, Blanchard and Gali, 2008, De Gregorio, Landerretcghem and Neilson, 2008, and Deutsche Bank 2007, 2008). We estimate a six variable recursive VAR with quarterly data, covering the period 1996Q1-2008Q2 for nominal prices of fuel and food commodities (in US\$ dollars), economic activity, the nominal effective exchange rate, monetary aggregates, and headline, food, fuel and underlying (non food and fuel) consumer prices. Aggregate demand shocks are proxied by the output gap (measured again as deviations of unemployment from its long-term trend). (See appendix for more details).

² See Gelos and Rossi (2007) and Celasun, Gelos, and Prati (2004).

9. **Impulse responses derived from the VAR estimations indicate how inflation has reacted to different types of shocks.**

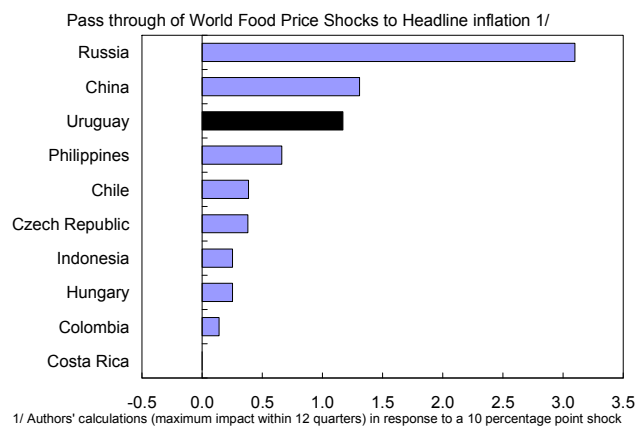
These responses take into consideration not only the direct impact of the shocks, but also their indirect impact through their feedback on other endogenous variables. We impose exogeneity conditions on both oil and food prices—these variables are assumed not to be affected by domestic conditions in Uruguay. For the remaining variables, a Cholesky factorization is used, with the



following ordering: domestic economic growth; money growth; exchange rate growth; and domestic inflation. To explore spillovers to other prices, we estimate the response of different inflation measures to a shock of 1 percent to three variables: commodity fuel inflation; commodity food inflation; and the output gap.

10. **Food commodity price shocks have a positive and significant impact on headline inflation.** The impact of these shocks on headline inflation is fairly protracted, with the response dying out within the course of a year. A 10 percentage point shock in world food commodity prices initially raises domestic headline inflation by 0.5 percentage points. After one year, headline inflation is higher by 1.2 percentage points as a result of the same shock.³ These results are in line with the Phillip's curve estimates (¶6). The estimated impact is higher when using indices in local currency, namely 1.8 percentage points after one year.

11. **The pass-through of food price inflation is relatively high compared to other emerging markets.** We estimated similar VARs for nine other countries; the pass-through for Uruguay is higher than in all but two countries in the sample. Comparing the estimated pass through for Uruguay with those found in other studies (see, for example, Deutsche Bank 2008) also confirms the relatively strong impact on CPI in the Uruguayan



³ We also examined the impact on the producer price index (PPI), finding that world food price shocks have a large positive and significant impact on producer prices, with the impulse response of the PPI to an increase in world food prices exceeding, in magnitude and duration, the response of consumer prices to the same shock. As in the case of CPI (¶14), the impact of world fuel prices on the PPI is minimal.

case. Possibly, this reflects the relatively rare use of price controls or voluntary price restrictions in Uruguay, as well as the relatively high share of tradable food items in CPI (14.3 percent).

12. Furthermore, there is evidence of spillover to most measures of core inflation.

The impact of food price shocks on the different measures of core inflation varies, but is generally positive, large, and even more persistent than the impact on headline inflation. The duration of the response of core inflation to the initial shock typically lasts between 1½ and 2 years. On average, a 10 percentage point shock raises core inflation by 0.8 percentage points immediately, and close to 2 percentage points by the end of the end of one year. In particular, measures of core inflation that exclude regulated prices show a larger acceleration in inflation in response to the original shock.

Horizon	Headline	CPI less fruits and vegetables	CPI less regulated prices	CPI less fruits, vegetables and regulated prices	CPI less fruits, vegetables, regulated prices and housekeeping	CPI less fruits, vegetables, regulated prices, housekeeping and tobacco products	Principal component index
1 quarter	0.53	0.43	0.91	0.82	0.94	0.94	0.72
1 year	1.17	1.07	1.87	1.82	1.89	1.71	1.75
2 years	0.97	0.86	1.75	1.75	1.76	1.50	1.59

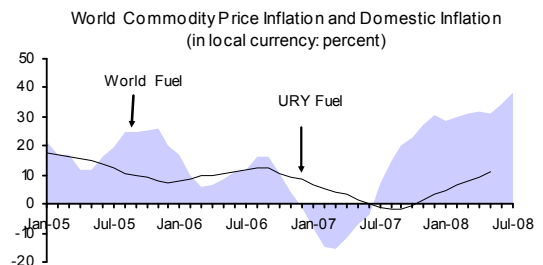
Source: authors' estimates

1/ Estimates are the percentage point change in inflation in response to a 10 percentage point increase in food commodity prices

2/ Official measures of core inflation

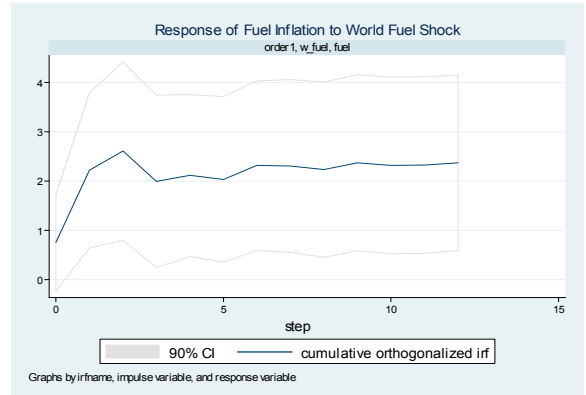
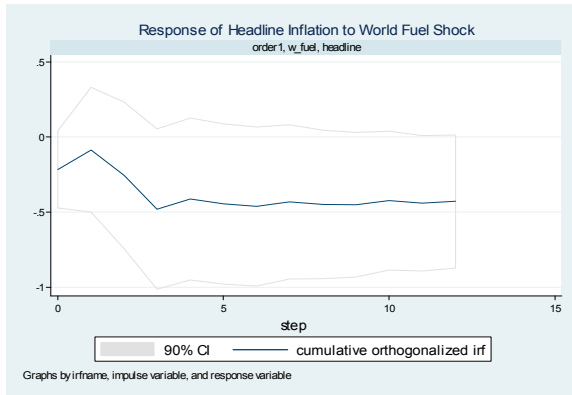
13. The impact of food commodity price shocks on the food sub-component of the CPI has also been sizeable. As expected, domestic food inflation responds significantly to the shocks, reflecting the large component of tradable food items in the total food basket. A 10 percentage point increase in world food prices raises domestic food prices immediately by 1.6 percentage points, and by 4 percentage points after a full year.

14. We do not find strong evidence of pass-through from world fuel price shocks to headline inflation. Fuel commodity price shocks do not have a statistically significant impact on headline inflation—the impact is positive and significant in the first two months following the shock, but becomes negative and insignificant thereafter. World fuel prices do have a positive and significant impact on domestic *fuel* inflation. However, there appears to be no statistically measurable spillover from fuel inflation to non-fuel inflation (i.e., headline inflation excluding fuel) when using the US dollar-based index in the estimations.⁴ In addition to the low

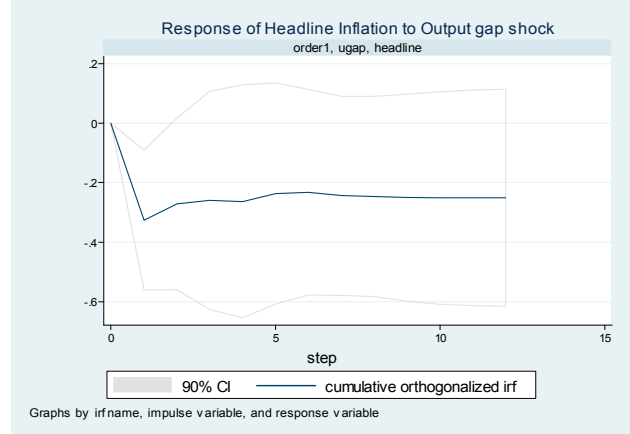


⁴ When using a peso-based price index, the initial impact is positive and significant, but after the first quarter, the impulse response loses significance.

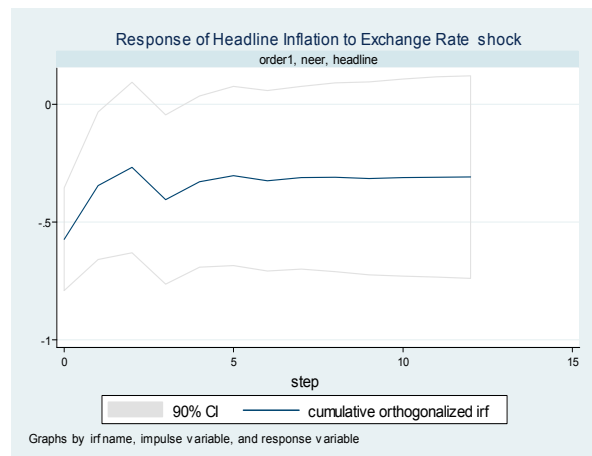
share of fuel in the CPI,⁵ this also likely reflects delays in adjustment of domestic fuel prices as well as regulated price—changes in domestic energy prices have not kept pace with increases in world fuel prices.



15. **The model finds evidence of demand side pressures on inflation.** As expected, headline inflation is affected by our measure of the output gap. In particular, a widening (fall) of the output gap has a negative (positive) and significant impact on headline inflation. A negative (positive) shock of 10 percentage points⁶ to the output gap measure is expected to lower (raise) headline inflation by 0.4 percentage points after 1 year.



16. **Exchange rate shocks also contribute to explaining CPI movements.** The initial impact of a currency appreciation on consumer prices is negative, as expected, and remains so for at least a year. By the end of two years, the response is imprecisely estimated. The pass through is quite large in the first year, with a 10 percentage point appreciation lowering headline inflation by about 3.8 percentage points. Hence, the

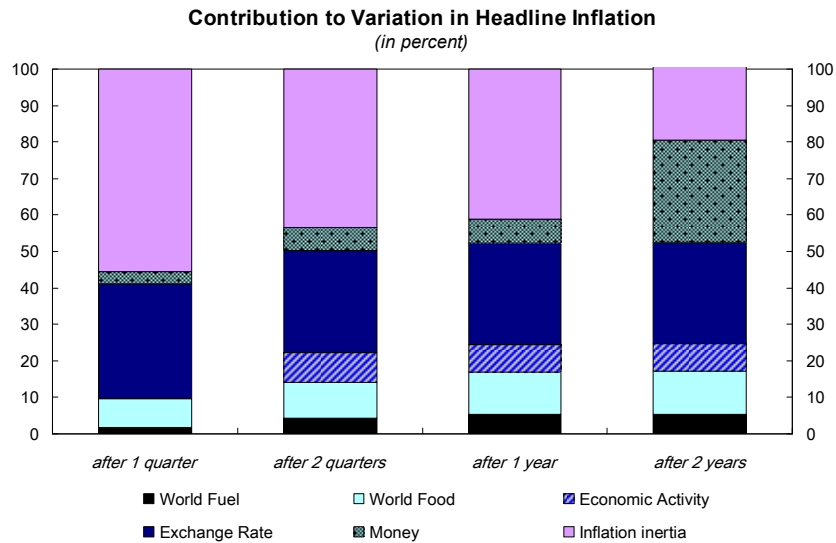


⁵ Gasoline products account for just under 3 percent of the total CPI basket.

⁶ On average, this would be equivalent to a 0.5 percentage point increase (decrease) in the unemployment rate.

strong rise of Uruguay's nominal effective exchange rate (17 percent since mid-2007) has helped to buffer the impact of external commodity shocks on domestic inflation.

17. **Over a longer time horizon, commodity prices explain only a moderate fraction of the total variation in headline inflation in Uruguay.** The variance decomposition allows us to assess how much of the forecast variance in domestic inflation over the estimated period can be attributed to external vs. domestic factors. In the last 10 years, variations in world food and oil prices have contributed only about 15-20 percent of the variation in total inflation. Aside from inertia and other factors not captured by the model, exchange rate changes explain around 28 percent of the variation in headline inflation.



C. Conclusions

18. **The rise of world food prices is clearly an important factor behind the rise in inflation in Uruguay.** The link between world food prices and domestic inflation is significant and robust, and stronger than in many other emerging markets. Roughly one third of current headline inflation levels can be traced to world food price inflation.

19. **However, domestic demand pressures have also played an important role, and spillovers to core inflation support the need to contain second-round effects.** Tighter fiscal and monetary policy would help dampen demand pressures. More exchange rate flexibility would also help, as evidenced in the sizeable contribution of exchange-rate movements in explaining variations in inflation. Lastly, avoiding backward-looking indexation mechanisms is critical to prevent exogenous shocks from becoming entrenched in inflation and inflation expectations.

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APPENDIX: VAR METHODOLOGY

We examine the sources of inflationary pressures in Uruguay using a six variable recursive vector autoregressive (VAR) model to isolate the impact of domestic and external shocks on domestic consumer prices. This approach captures the dynamic structure underlying the interaction between strictly exogenous world fuel and food commodity price shocks, as well as (endogenous) economic activity, the exchange rate, monetary policy and domestic consumer prices. The model simultaneously regresses each endogenous variable on lags of itself and all other variables in the model. The underlying recursive structure of the variance-covariance matrix allows for identification of shocks stemming from external and domestic developments, and estimation of their effects on consumer prices.

VAR models have been widely used in the literature analyzing the response of an economy to commodity price shocks. Recent studies include De Gregorio, Landerretche and Neilson (2007) and Pincheira and Garcia (2007) who analyze the effects of oil shocks on inflation in Chile; Blanchard and Gali (2007) who explain changes over time in the macroeconomic effects of oil shocks in industrialized countries; and Mishkin and Schmidt-Hebbel who analyze the macroeconomic effects of external shocks under inflation targeting.

A VAR approach is relevant for analyzing a phenomenon, such as rising inflation, without imposing a prior theoretical approach. Hence the approach suits the purposes of the current study given that it does not require necessarily having strong priors about competing explanations for rising inflation, instead allowing the regularities found in the data to tell a story. World fuel and food prices are treated as exogenous variables, and hence assumed to be determined independently of the rest of the system. Ordering of the endogenous variables in the VAR to achieve identification is informed by economic theory and supported by Granger causality tests. Shocks in the system are identified according to the following recursive specification⁷:

$$\pi_t^{fuel} = E_{t-1}[\pi_t^{fuel}] + \varepsilon_t^{fuel} \quad (1)$$

$$\pi_t^{food} = E_{t-1}[\pi_t^{food}] + \varepsilon_t^{food} \quad (2)$$

$$\Delta y_t = E_{t-1}[\Delta y_t] + \beta_1 \varepsilon_t^{fuel} + \beta_2 \varepsilon_t^{food} + \varepsilon_t \Delta y \quad (3)$$

$$\Delta e_t = E_{t-1}[\Delta e_t] + \gamma_1 \varepsilon_t^{fuel} + \gamma_2 \varepsilon_t^{food} + \gamma_3 \varepsilon_t \Delta y + \varepsilon_t \Delta e \quad (4)$$

$$\Delta m_t = E_{t-1}[\Delta m_t] + \theta_1 \varepsilon_t^{fuel} + \theta_2 \varepsilon_t^{food} + \theta_3 \varepsilon_t \Delta y + \theta_4 \varepsilon_t \Delta e + \varepsilon_t \Delta m \quad (5)$$

$$\pi_t^{CPI} = E_{t-1}[\pi_t^{CPI}] + \delta_1 \varepsilon_t^{fuel} + \delta_2 \varepsilon_t^{food} + \delta_3 \varepsilon_t \Delta y + \delta_4 \varepsilon_t \Delta e + \varepsilon_t \Delta m + \varepsilon_t^{CPI} \quad (6)$$

The system incorporates the dynamic effect of a commodity price shock on domestic prices, with shocks affecting prices both directly as well as indirectly via previous stages. The domestic price variable contains the expected inflation at month t , the supply and demand shocks, the exchange rate and monetary policy shocks, as well as shocks due to CPI inflation.

⁷ π_t^{fuel} and π_t^{food} are world fuel and food price inflation respectively, Δy_t is the first log difference of the activity index, Δe_t is the first log difference of the nominal effective exchange rate, Δm_t is the first log difference of the monetary aggregates and π_t^{CPI} is the rate of CPI inflation

II. URUGUAY'S CREDIT SURGE: HEALTHY REVIVAL OR CREDIT BOOM?¹

After years of depressed levels, credit growth has accelerated sharply, reaching about 40percent in the 12 months to June 2008. The expansion has been mostly driven by growing consumption and corporate loans, reflecting improved incomes and favorable growth prospects. Financial deepening, however, remains low relative to historical levels and other countries in the region. Credit dollarization remains high, although the currency denomination of loans appears to appropriately match the currency of borrowers' income. While sustained rapid credit growth could lead to vulnerabilities, the risk of a possible loosening in lending standards appears contained at present by a broadly appropriate prudential framework. Up to August 2008, the turbulence in global financial markets did not seem to affect the credit recovery, partly reflecting Uruguay's sound banking system. However, more recent prospects of a global slowdown and heightened volatility in global financial markets could halt this recovery.

A. A Brief Historical Perspective

1. **After being a regional financial hub, Uruguay's banking system contracted sharply during the 2002-03 crisis.** With investment grade and a large presence of foreign banks, Uruguay was seen as a regional financial center during the 1990s. An over 50 percent credit-to-GDP ratio in 2001 ranked only second after Chile in the region. Non-resident deposits, mostly from Argentines, reached some 40 percent of deposits, and lending activities across borders were important—with loans to non-residents at about 10-12 percent of total loans. However, a massive deposit run—largely explained by a sharp deposit withdrawal by non-residents—led to a 48 percent contraction of deposits from end-2001 to end-2003. Credit to the domestic non-financial private sector also contracted sharply from US\$ 10.5 billion (51 percent of GDP) at end-2001 to about US\$ 4.0 billion (24 percent of GDP) at end-2004.
2. **Domestic credit remained depressed for several years after the crisis.** After bottoming at US\$ 6.8 billion, in April 2003, deposits started to increase, reaching US\$10 billion by end-2006. Despite this recovery in available funding, domestic credit remained largely depressed, hovering around US\$ 4.0-4.5 billion during this period. This reflected both demand and supply factors, including stricter prudential regulations, particularly on large public banks, risk-aversion after the crisis and low investment-related demand.² Tight legal restrictions precluded public banks—particularly *Banco Hipotecario Nacional* (BHU)—from expanding their credit portfolios, and many private banks focused on a business model built

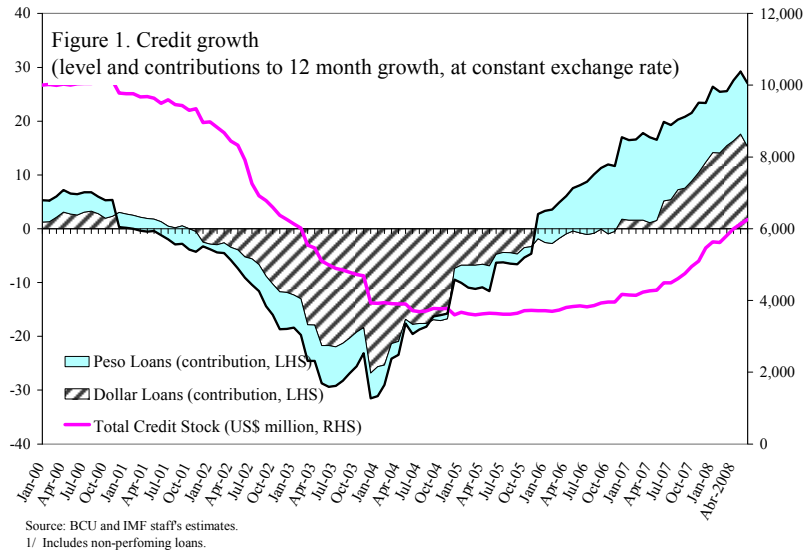
¹ This paper was prepared by Gustavo Adler and Mario Mansilla.

² See Canales-Kriljenko and Gelos, 2006.

around low domestic deposit (dollar) interest rates and higher low-risk or risk-free returns on foreign assets.

B. The Recent Credit Acceleration

3. **Since late 2006, credit growth accelerated significantly (Figure 1).** Credit to the non-financial private sector grew by 50 percent in dollar terms (adjusted for exchange rate variations)³ from end-2006 to June-2008, with much of the hike occurring during the last 12 months (39 percent). In addition, while still small, non-bank financial enterprises (“Administradoras de Credito”) have been expanding their domestic lending quite rapidly.



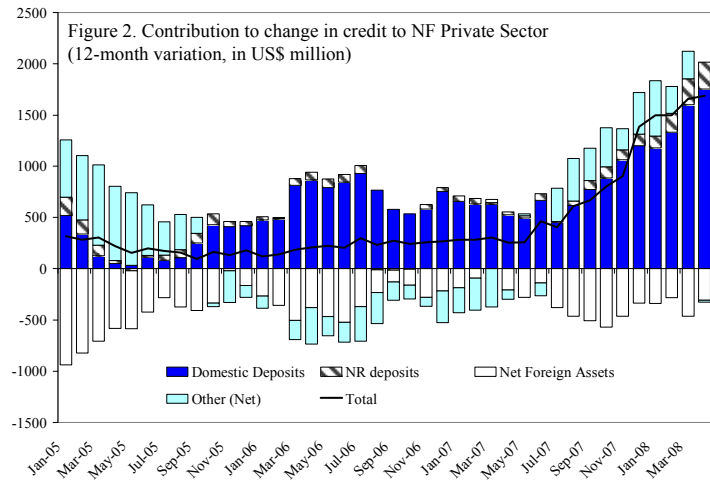
4. **Both structural and cyclical factors are likely to have contributed to the resumption of credit.** Particularly important have been: (i) the improvement in the balance sheet of *Banco de la Republica Oriental del Uruguay* (BROU) and the gradual normalization of its lending activities; (ii) strong deposits inflows; (iii) falling interest rates in the US—and uncertainty over the quality of financial assets in mature markets—that induced a shift in banks’ portfolios away from foreign assets and towards local assets; (iv) improving incomes—reflecting several years of high growth and a recovery of real wages—as well as favorable growth prospects—supported by prudent macroeconomic policies and a booming external environment for Uruguayan exports; and finally (v) improving firms’ balance sheets, that have made them attractive to lenders.⁴

³ Growth rates refer to stock of credit to the non-financial private sector, excluding non-performing loans. They also exclude credit extended by “Administradoras de Credito,” as these operate outside the banking system.

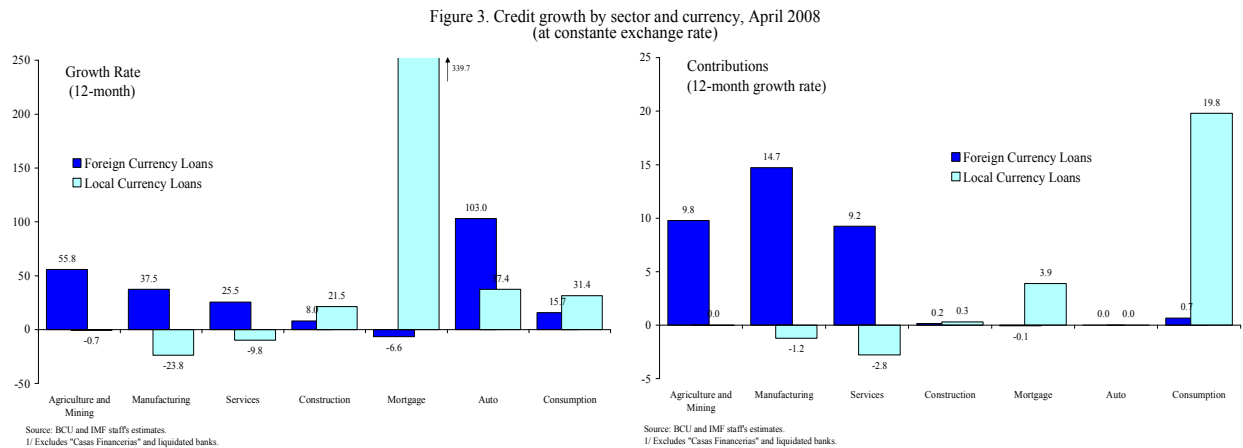
⁴ See Licandro (2006).

5. The rapid expansion of credit has been funded mainly with growing deposits.⁵

Until 2006, a significant share of new available funding was invested in foreign and domestic assets other than credit to the private sector⁶ (Figure 2). For example, during 2005-06 banks increased domestic credit only by US\$0.5 billion, despite receiving US\$ 1.3 billion in deposits. Since end-2006, however, banks appear to have shifted their portfolio allocations, extending about US\$1.8 billion in domestic credit, out of a US\$2.3 billion increase in deposits.



6. From the demand side, credit growth has been mainly driven by consumption and corporate loans (Figure 3). While mortgage and auto loans are the most dynamic segments, with growth rates of over 300 and 100 percent, respectively, their contribution to overall credit growth has been low given their still limited volume. Within corporate credit, loans to tradable-good sectors (agriculture, mining and manufacturing) have grown most markedly, although credit to the service sector has also increased considerably.



⁵ The contributions to credit growth are computed as:

$\Delta \text{Credit to PS} = \Delta \text{Deposits of PS} + \Delta \text{Non Resident Deposits} - \Delta \text{NFA} + \Delta \text{Equity} - \Delta \text{Other (domestic) Assets}$, where PS refers to the (non-financial) private sector and NFA refers to net foreign assets. Figures include valuations effects.

⁶ Both net foreign and net domestic assets increased significantly during this period, although the later included large deposits made by banks on the central banks, which were subsequently invested abroad.

7. **Financial intermediation in Uruguay remains highly dollarized (Figures 4 and 5).** The share of credit denominated on U.S. dollars has fallen from 65 percent of total credit in 2000 to 58 percent in 2008, although mainly explained by activities of public banks. Dollarization in these banks has fallen from 50 percent to 32 percent, while in private banks has remained broadly constant at around 80 percent. That said, dollar loans have been extended mainly to corporate tradable sectors while peso loans mostly to consumers (which generally have incomes in pesos), pointing to an appropriate match between the currency denomination of loans and the borrower's source of income.⁷ The service sector seems to be the exception to this pattern, although this sector may include a number of activities closely associated to the tradable sector.

Figure 4. Credit by Sector, April 2008
(in percent of GDP)

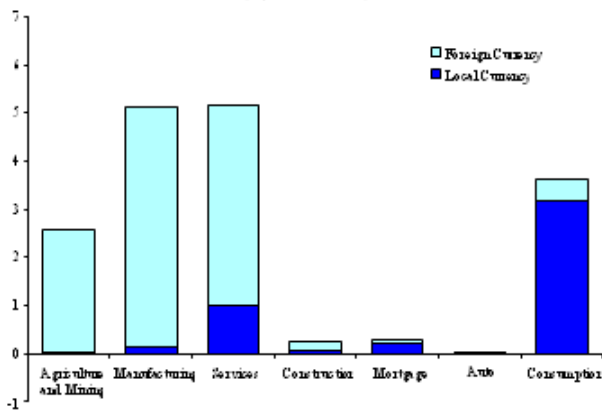
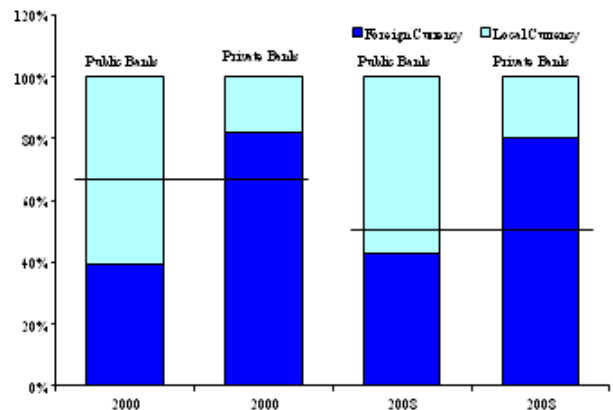


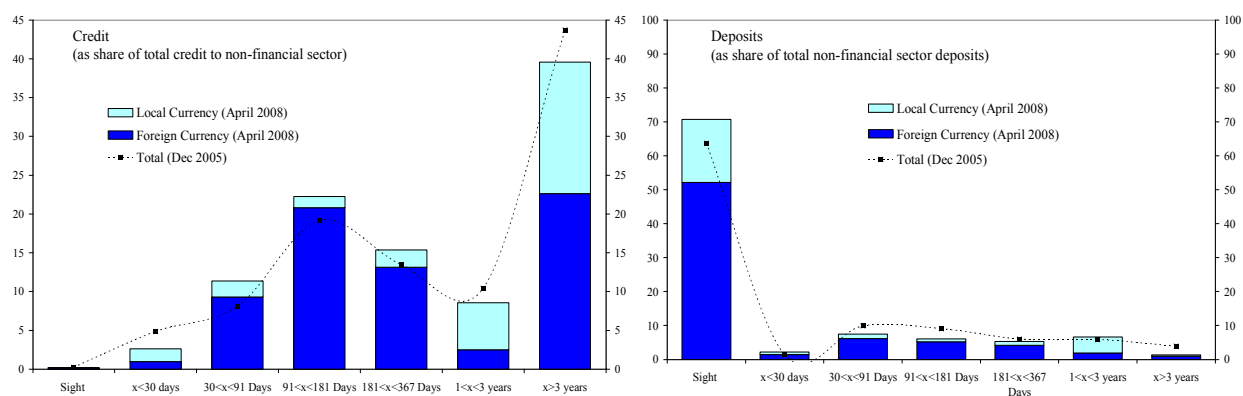
Figure 5. Credit by Ownership and Currency



8. **Credit to the private sector remains of relatively short maturity, with about 60 percent being of less than 3 years (Figure 6).** Moreover, maturities have become slightly shorter between 2005 (before the credit acceleration) and 2008, possibly reflecting the resumption of (short-term) consumption credit. It may also reflect restrictions on maturity mismatches, as deposits continue to be of very short maturity (about 70 percent of deposits remain of less than 30-day maturity).

⁷ This currency matching is likely to reflect binding prudential regulation that requires demanding stress tests, including with exchange rate shocks, on borrower's ability to service debt obligations.

Figure 6. Currency and Maturity Structure, April 2008



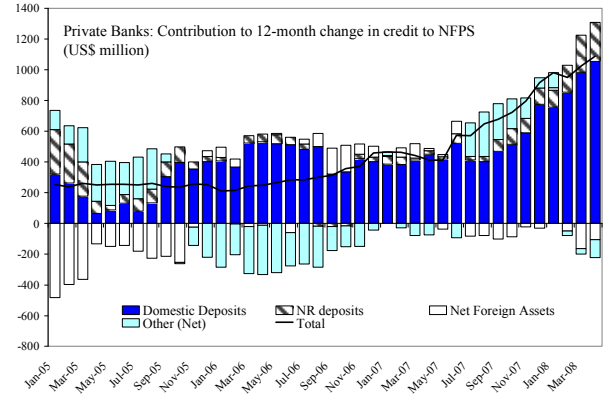
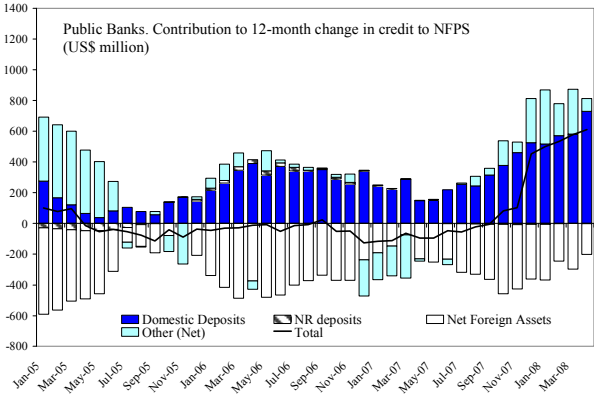
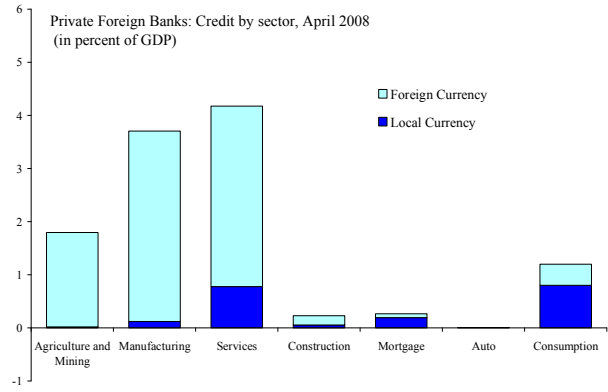
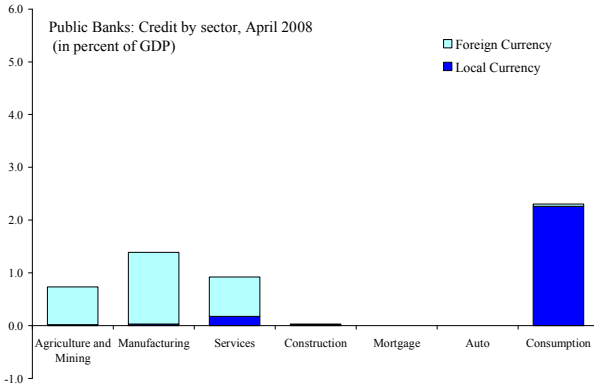
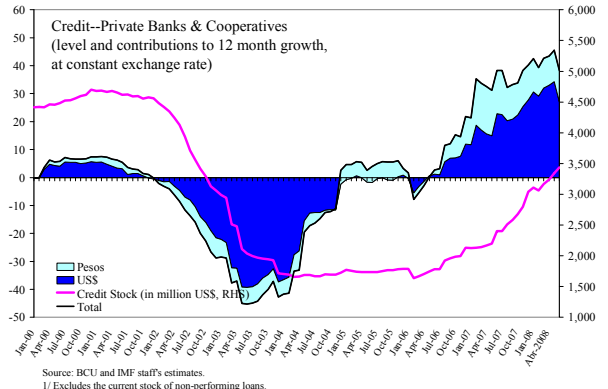
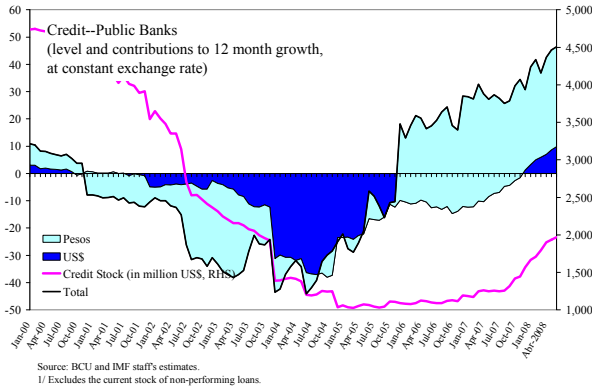
9. **While both private and public banks have expanded their credit operations recently, they have focused on different types of credit (Figure 7).** Credit extended by private and public banks—excluding *BHU*—grew by 41 percent and 36 percent, respectively, from end-2006 to June-2008. However, public banks expanded their lending in local currency, while private banks continued to lend mostly in foreign currency. This difference seems to reflect a segmentation of credit markets, as public banks (BROU) have specialized on consumer loans, while private banks on corporate loans. In terms of funding, public banks seem to have a more cautious approach—still investing a significant share of their newly available funding in foreign assets—than private banks. In addition, the bulk of new non-resident deposits have gone to private banks, and these institutions seem to have channeled such funds towards foreign assets.

10. **In addition to rapidly expanding commercial banks, non-bank financial enterprises (“Administradoras de Crédito”) are becoming important players in the credit market.**⁸ Currently, with credit stocks of about US\$250 million—mostly in the form of (high-interest-rate) consumer loans—they remain small relative to commercial banks, but have been rapidly expanding their portfolios recently. Further, some of these companies are linked to commercial banks in Uruguay, and operate as loan originators, thus pointing to further increases in banks’ credit portfolios going forward.⁹ They have also been entering the local capital markets, through the issuance of relatively short term paper.

⁸ These are financial entities that mainly serve to originate consumer loans and micro credits in markets not covered by traditional banks. They are less regulated than banks and generally more cost-efficient.

⁹ When loans are transferred to commercial banks, standard prudential regulations apply.

Figure 7. Public versus Private Banks

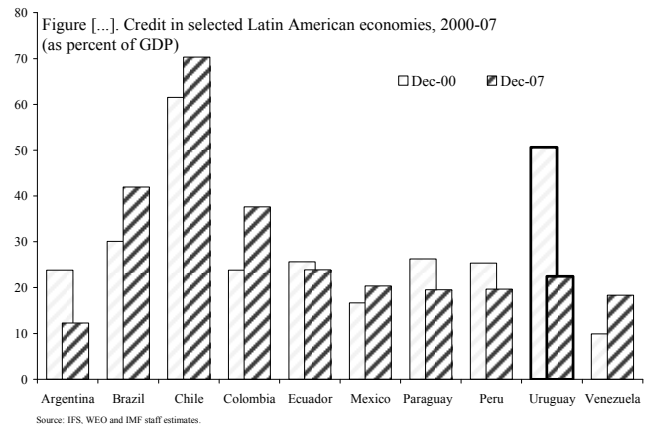


Source: BCU and IMF staff estimates.

C. Risks of a Sustained Rapid Credit Expansion

11. **Despite the recent acceleration, credit remains low compared to pre-crisis levels.**

At about US\$ 6.2 billion (24 percent of GDP), credit to the non-financial private sector compares low with levels of about 50 percent of GDP prior to 2002. Also, Uruguay's still low level of credit relative to some neighboring countries is particularly evident if alternative financing channels are taken into account, as other countries in the region (e.g. Brazil, Mexico) have significantly more developed local private capital markets.



12. **Risks associated with cross-border activities appear presently well contained.**

The pace of growth of non-resident deposits, while recently accelerating¹⁰, has been in line with that of residents deposits, thus keeping the share of non-resident deposits at about 15 percent of total deposits in the system (20 percent in relation to foreign currency deposits). Further, the growth of non-resident deposits seems to be properly backed by further accumulation of net foreign assets. In addition, unlike the pre-crisis period, the expansion of credit by banks has been concentrated solely in the domestic economy, keeping loans to non-resident below 2 percent of total loans in the system.

13. **Key financial soundness indicators remain robust.** The rapid acceleration of credit has not been accompanied by a deterioration of financial indicators. In particular, despite its recent expansion, credit to the private sector has remained below 30 percent of total assets, (30-day) liquidity ratios remain high at about 62 percent of short-term liabilities, non-performing loans (NPLs) are very low at about ½ percent, provisions are high as share of NPLs, and capitalization ratios (at about 10 percent of total assets) have remained above the 8 percent requirement. At current levels, even if the economic cycle reverts and non performing loans come back to normal levels, banks provisions are likely remain ample.

¹⁰ The recent increase in non-resident deposits has been, arguably, driven by a flight to 'safety' triggered by some financial turbulence in Argentina in the first quarter of 2008.

Table 1. Key Financial Soundness Indicators

	Dec 2005	Dec 2006	June 2007	Dec 2007	June 2008
Capital/total assets (book value)	8.2	9.4	10.1	10.5	10.6
Return on assets 1/	0.84	1.02	1.71	1.32	0.99
Asset composition:					
Credit NFPS/total assets	22.8	24.5	25.2	29.0	29.5
Foreign assets/total assets	21.6	24.2	26.8	23.0	18.3
Liquidity ratio (30 days) 1/	80.7	110.6	69.1	53.9	62.2
NPLs % weighted 1/	5.66	4.11	3.37	1.12	0.44
Provisions (share of NPLs) 1/	1082	1068	1008	718	683

Source: BCU and IMF staff's estimates.

1/ Weighted by market share.

14. **The evidence points to a healthy revival of credit.** At the current juncture, vulnerabilities associated to Uruguay's rapid credit expansion seems contained. Further, immediate risks point to a possible halt of this recovery, as global financial conditions and growth prospects worsen.

15. **Over the medium-term, a sustained rapid expansion could pose a number of challenges:**

- **Credit standards risks.** An expansion of credit, and the associated financial deepening, should, in principle, help in fostering economic growth, allowing capital to reach investments with high rate of return and support consumption smoothing. However, the empirical evidence has shown that there is often a trade-off between rapid financial deepening and financial stability and credit booms have often been associated with a loosening of lending standards.¹¹ While at the current juncture these risks seem contained in Uruguay, continued vigilance by monetary and regulatory authorities will be key to ensure that such vulnerabilities do not build up if rapid credit growth persists.
- **Macroeconomic management challenges.** In the context of inflationary pressures, a credit boom exacerbates domestic demand pressures and potential macroeconomic imbalances (e.g. fueling a current account deficit), and further complicates monetary and fiscal policy. It could also lead to assets price bubbles. Continued monitoring and management of domestic credit conditions should remain an important component of monetary policy.

¹¹ See Dell'Araccia (2006).

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III. ASSESSING URUGUAY'S VULNERABILITY TO EXTERNAL SHOCKS: A BAYESIAN VAR APPROACH¹

This paper assesses the potential impact of different types of external shocks on the Uruguayan economy, using a Bayesian VAR approach that combines historical data with authors' informed beliefs. The results show that Uruguay is still sensitive to the financial conditions and economic performance of countries in the region, and somewhat vulnerable to a worsening of global financial conditions, mainly through the potential impact of mature market interest rates. Mild scenarios of deteriorating external conditions would have limited impact on Uruguay's economic performance, possibly reflecting recent improvements in export diversification, some decoupling from neighboring countries, and important advances in debt sustainability and structural reforms. However, as a commodity exporter small open economy, Uruguay remains vulnerable to a pronounced global downturn.

A. Introduction

1. **Following a period of high price and output volatility early in this decade—largely explained by external developments—Uruguay's vulnerability to external shocks has decreased significantly in recent years.** This has been the result of sound macroeconomic policies and a benign external environment that has allowed the authorities to build buffers against external shocks and implement significant structural reforms. However, as a small open economy with close links to neighboring countries and the world, Uruguay could still be affected by the changing global environment.
2. **To assess the potential impact of external shocks on the Uruguayan economy, a Bayesian VAR model is estimated.** The methodology allows to combine historical data with authors' prior knowledge on plausible paths for the relevant variables over the medium term, thus improving the forecasting properties of the model (relative to a standard VAR). It also allows to capture both the direct and indirect effects of certain external shocks (e.g., the direct effect of a terms-of-trade shock on Uruguay and its indirect effect through the economic performance of trading partners that share a similar export structure). The estimated model is used to forecast Uruguay's GDP growth for a baseline scenario as well as alternative scenarios with predetermined paths for certain external variables (conditional forecasts).

B. The Model

3. **The paper focuses on three types of external shocks that could affect Uruguay through trade and financial channels:** (i) economic performance in trading partners (a measure of demand for Uruguayan exports); (ii) global financial conditions; and (iii) terms of

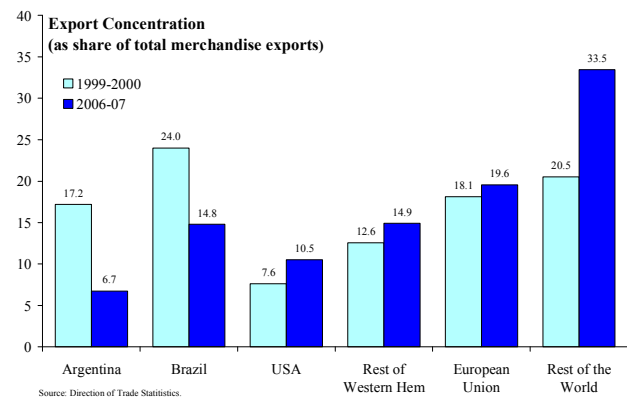
¹ Prepared by Gustavo Adler and Mario Mansilla.

trade. Specifically, the basic specification of the empirical model is based on the following vector of variables:

$$x_t = (\Delta y_t, \Delta y_t^{TP}, EMBI_t^{LA}, i_t^{US}, TOT_t, DDt)$$

where:

- y_t denotes the log of Uruguay's GDP;
- y_t^{TP} is a trade-weighted average of (log) GDP in trading partners. This synthetic variable measures the average growth of trading partners weighted by a four-quarter rolling average of their participation in Uruguay's merchandise exports (y_t^{TP}). Embedded in this variable are the changes in Uruguay's trade structure during the last decade. This allows to capture the fact that, following the 2002 crisis, the country has significantly diversified its exports markets (both for goods and services) outside of South America, reducing the scope for spillovers from economic volatility in the region;
- $EMBI_t^{LA}$ is the Latin American JP Morgan EMBI Spread, and it is used as a proxy of financial conditions in the region;
- i_t^{US} is the 3-month US Treasury bill interest rate, which proxies financial conditions in mature markets;
- TOT_t denotes Uruguay's terms of trade; and
- DDt is a control variable for exogenous domestic demand factors. In the basic model, government consumption in real terms ($Govcons$) is used.
- In addition, a dummy variable for the period 2001QI-2003QII is included to control for the impact of the financial crisis.



4. **The model is estimated using quarterly data for the period 1994-2007 within a Bayesian VAR approach.**² All variables are expressed in percent changes with respect to the same period in the previous year, except for $EMBI^{LA}$ and i^{US} , which are taken in levels. The steady state priors are based both on recent history as well as authors' beliefs on plausible ranges for the medium-term. The priors assume higher than historical potential growth in Uruguay (3.5 percent median) mainly reflecting the recent wave of investment; partners' growth (at about 3 percent median) is in line with average levels in the sample, and interest rates in mature markets are assumed to return to the levels observed in 2005-06. The prior distribution of the $EMBI^{LA}$ (centered at 400bps) reflects likely higher risk aversion towards the region than in the last few years, while the prior distribution for the change in terms of trade is centered on zero (no change over the medium term).

Priors Assumed for the Regressors (95 percent probability interval)		
Variable	Lower bound	Upper bound
Uruguay's growth	3.0	4.0
Partners' growth	2.0	4.0
EMBILA	350	450
US interest rate	4.5	6.5
Terms of trade	-2.0	2.0

C. Main Results

5. **The model yields very sensible results.**³ The basic specification confirms the relevance of external factors and with the expected signs. For example, a one standard deviation shock in the exogenous variables (expressed in each variable's units) would cause the following effects on Uruguay's GDP growth (Figure 1):

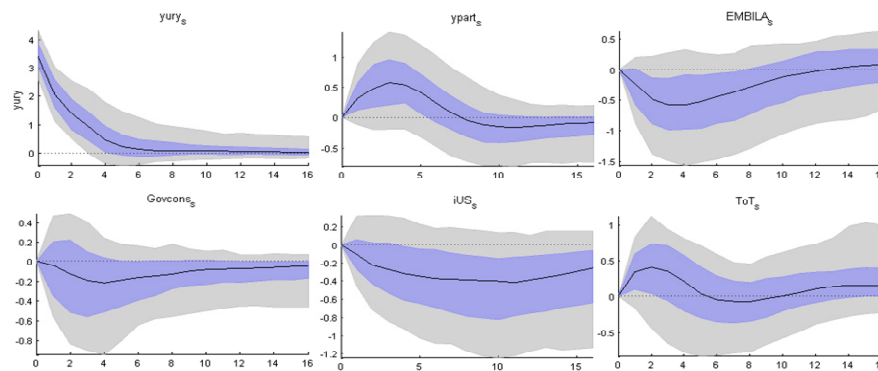
- (i) A 1 percent deceleration in trading partners' growth would lead to a ½ percentage point fall in Uruguay's GDP growth within 3 quarters, with the effect fading away within eight quarters. Given the decreasing importance of neighboring countries in Uruguay's trade, the results imply that a 1 percent fall in growth both in Argentina and Brazil would cause a 0.25 percent deceleration in Uruguay today, while the effect would have been as much as 0.40 percent 10 years ago.
- (ii) A 180 bps shock in the $EMBI^{LA}$ spread would reduce Uruguay's growth by about ½ percent within 4 quarters, and the initial impact would persist for almost three years. The effect of a shock in the $EMBI^{LA}$ spread on the domestic real economy

² A Matlab facility developed by M. Villani is used to estimate the model. For a description of the methodology and similar country applications see Abrego & Osterholm (2008) and Osterholm & Zettelmeyer (2007).

³ Alternative specifications—including the real effective exchange rate as a control variable or including alternative measures of external financial conditions (like the High Yield bond spread or the VIX index)—were explored but did not improve the results.

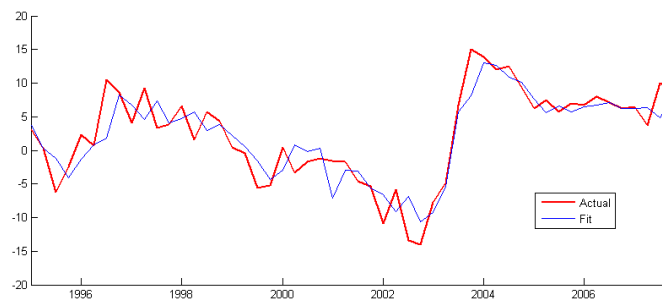
- could operate through different channels, including through an increase in funding costs for the private sector and through the fiscal effect of higher debt service burden. As the second effect would depend on the level of public debt, and the latter has fallen significantly in recent years, it is possible that this result overestimates somewhat the impact going forward.⁴
- (iii) A 50 bps increase in the US interest rate would result in $\frac{1}{2}$ percentage point lower growth. This effect appears to be highly persistent—partly reflecting the inertia in US interest rates—lasting for almost four years.
 - (iv) A 4 percent fall in ToT would lead to a 0.3 percent fall in economic growth. It's effect, however, fades away fairly quickly (within 6 quarters).

Figure 1. Impulse Response Functions
(at 50 and 95 percent confidence levels)



6. **These results seem to validate the hypothesis that external factors play a significant role on the economic performance of the country, explaining about $\frac{1}{4}$ of the historical variance of GDP growth. Moreover, the regression yields a fairly good fit.**

Benchmark Regression: In-sample Forecast
GDP growth

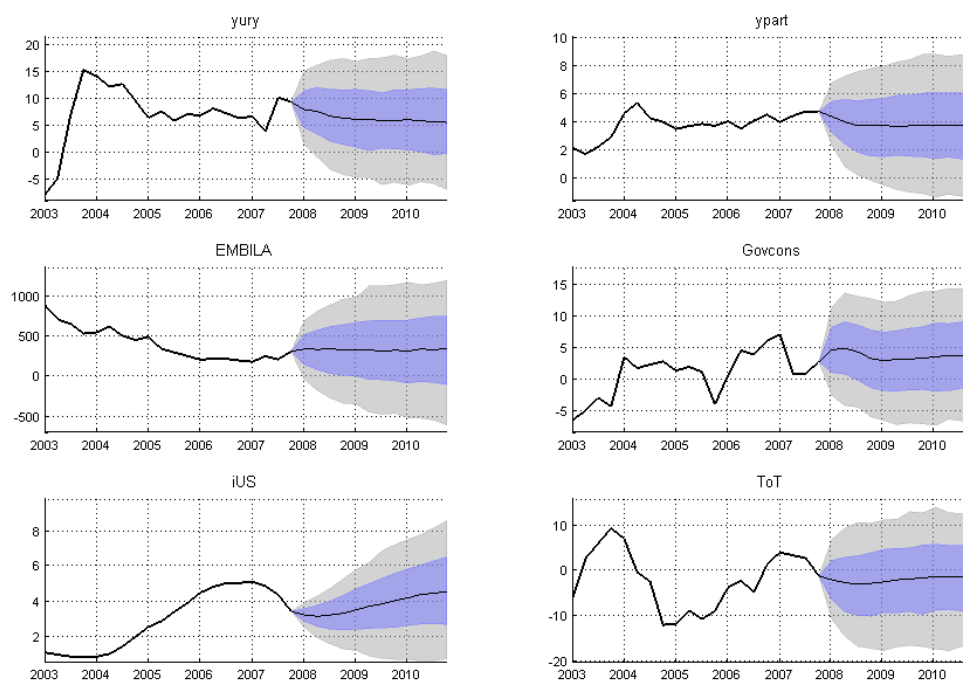


⁴ The estimates could also be upward biased due to effect of the 2002-03 financial crisis, when Uruguay's GDP contracted significantly while the EMBI^{LA} shot up mainly reflecting Argentina's sovereign default and the uncertainty associated to the Brazilian presidential election.

D. Forecasting

7. **On the basis of the basic model estimation, the Bayesian VAR method allows to make forecast scenarios based on predetermined paths for a subset of variables, testing the sensitivity of growth to simulated stress situations.** An unconditional forecast (in the absence of shocks) suggests that Uruguay would continue to grow strongly, at about 7¼ percent in 2008 and slowing down to 6 percent by 2010 (Figure 2). This would be supported by continuously strong growth in trading partners (near 4 percent on average) and relatively low EMBI^{LA} spreads (about 320 bps on average).

Figure 2. Unconditional Forecast



8. **Asymmetric commodity price shock scenario (Figure 3.A).** Uruguay seems less vulnerable to a sharp and widespread fall in commodity prices than other EMEs in the region. This is because the impact of lower agricultural prices would be offset by lower oil prices (Uruguay is a net oil importer). However, an asymmetric shock—with a more pronounced fall in agriculture prices—could have an important impact on Uruguay directly through its ToT and indirectly through the effect on regional trading partners with a similar export structure. In this respect, the model suggests that, a 7 percent average fall in ToT and a 1.6 percent lower growth in trading partners (relative to the benchmark) would reduce GDP growth by 2.5 percent towards 2010.

9. **Financial shock (Figure 3.B).** This scenario explores the effect of a shift in economic conditions in developed markets and a change in the risk appetite of global investors that raises debt spreads for emerging markets. In this case, the model points to a significant impact on growth, possibly derived from a tightening of monetary policy in developed economies.⁵ In particular, a 100bps higher US interest rate and a 250bps EMBI^{LA} spread increase (relative to benchmark) over the medium term would reduce Uruguay's GDP growth by about 2¼ percentage points by 2010.

10. **Regional slowdown (Figure 3.C).** Finally, in an environment of regional slowdown, for example leading to 1.6 percent lower growth in Uruguay's trading partners and coupled with higher risk aversion towards emerging markets—resulting in a hike of the EMBI^{LA} spread to about 600bps—Uruguay's GDP growth would slowdown by some 2 percentage points by 2010 (relative to benchmark).

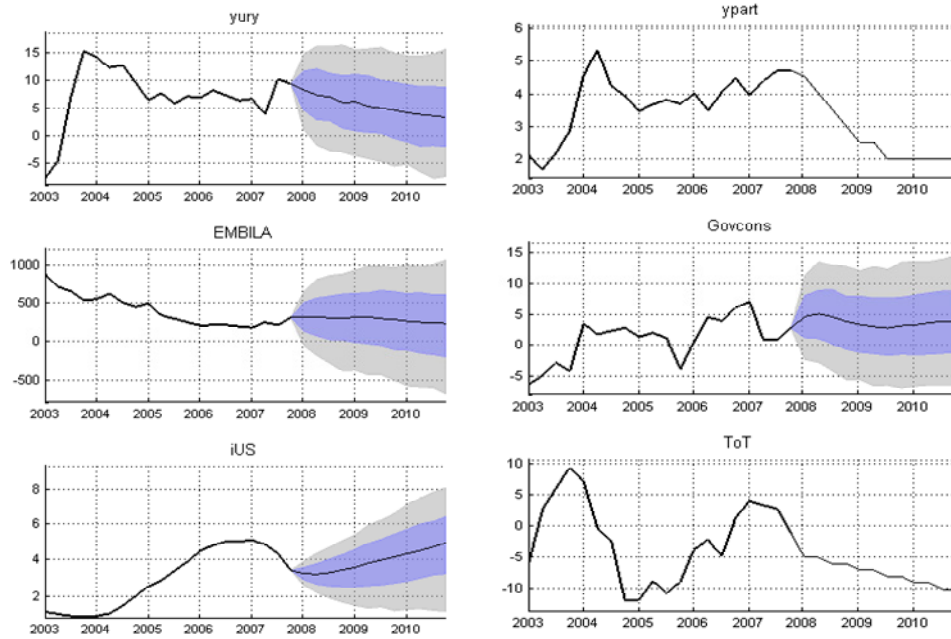
E. Conclusions

11. **While Uruguay has significantly reduced its vulnerability to external shocks**—on account of sound macroeconomic policies, the build up of buffers against external shocks, some decoupling from neighboring countries and significant structural reforms in recent years—as a small open economy it is still exposed to regional and global shocks. In particular, econometric estimates suggest that Uruguay is still sensitive to the financial conditions and economic performance of countries in the region, and to a worsening of global financial conditions, mainly through the potential impact of mature market interest rates. While mild scenarios of worsening global conditions would have limited impact on Uruguay's economic performance, a pronounced global economic downturn could have significant impact on Uruguay, particularly through its effect on commodity prices and the economic conditions of key trading partners.

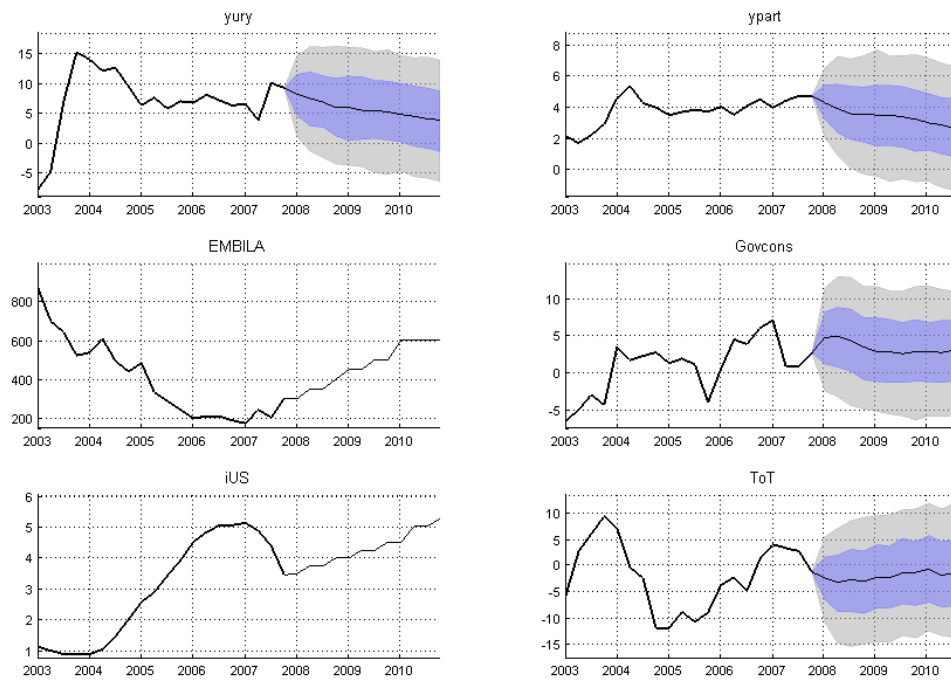
⁵ An adverse scenario in mature markets where the fight against inflation pushes international interest rates up, could affect Uruguay through an increase in the debt service burden—especially if combined with higher debt spreads to emerging markets—although Uruguay's debt management has reduced the potential impact of that scenario for the immediate future.

Figure 3. Conditional Forecasts

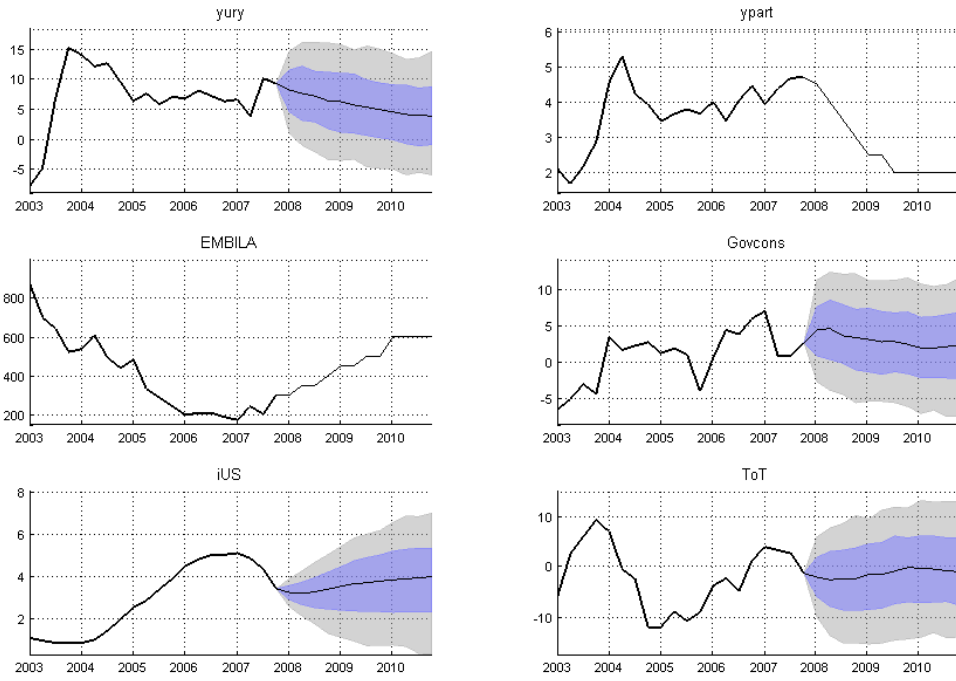
A. Asymmetric Commodity Price Shock



B. Financial Shock



C. Regional Slowdown Scenario



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