Uruguay: Selected Issues

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URUGUAY

Selected Issues

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Approved by the Western Hemisphere Department

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I. WHY ARE INFLATION AND INFLATION EXPECTATIONS ABOVE TARGET IN URUGUAY[1]?

"[T]he inflationary trend as well as inflation expectations raise concerns for the central bank [...] it is necessary for agents expectations to converge within the target range[...]"(BCU, 2012 pp. 23)

"The persistence of inflation expectations above the target range set by the Macroeconomic Coordination Committee demands firm actions in terms of macroeconomic policy" (MEF, 2012 pp.30-31)
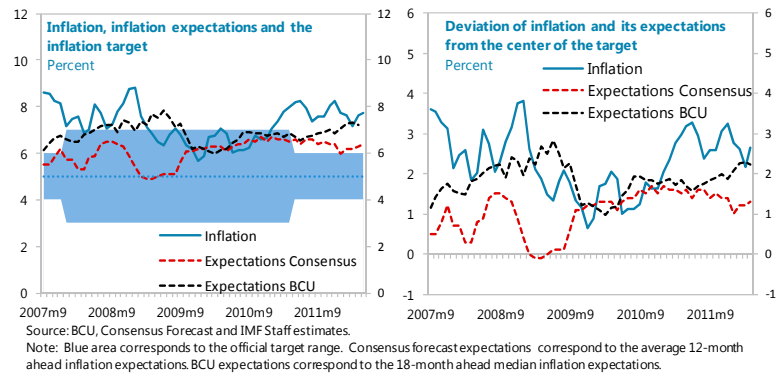
A. Background

1.   **Uruguay has won the battle against its very high inflation observed between the 1960s and early 1990s (Figure 1).** After exceeding 130 percent in the mid-1980s, inflation gradually declined to single digits by the late 1990s. The progress was blown temporarily off course by the currency and financial crisis of 2002 that pushed inflation above 20 percent. But after peaking at 28 percent in March 2003, inflation declined to single digits by 2004 and it has remained in single digits since then (7.3 percent on average in January 2004–September 2012), marking the longest period of single digit inflation in recorded history.

Source: Instituto Nacional de Estadistica.
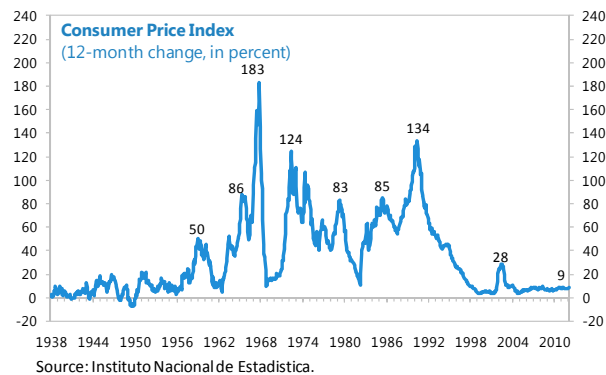
2.   **However, inflation and its expectations have remained stubbornly above the authorities' official inflation target range (4–6 percent).** Following the move to a floating exchange rate regime in 2005, Uruguay gradually transitioned to a new monetary policy framework. The interest rate became the main monetary policy instrument in September 2007.[2] However, unlike the experience of other countries

Source: BCU, Consensus Forecast and IMF Staff estimates.
Note: Blue area corresponds to the official target range. Consensus forecast expectations correspond to the average 12-month ahead inflation expectations. BCU expectations correspond to the 18-month ahead median inflation expectations.

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[1] Prepared by Camilo Tovar. This Selected Paper has benefited from useful discussions with Oya Celasun, Ulric Erickson von Allmen, Camila Perez, and Francisco Arizala. I thank comments by Gerardo Licandro, José Antonio Licandro, and Seminar Participants at Banco Central del Uruguay. Nakul Kapoor and Francisco Arizala provided assistance.

[2] There is no official date for the adoption of inflation targeting in Uruguay. In this paper, we consider the starting point to be when the interest rate became the main monetary policy instrument. For a discussion of some considerations on the implementation of IT in Uruguay see Licandro (2000).

that moved to IT, Uruguay's inflation and inflation expectations have persistently exceeded the officially established target range.[3] Moreover, the magnitude of Uruguay's persistent overshooting of inflation expectations relative to target exceeds those of its peers.[4]

3.   **Reducing inflation is now a top policy priority.** The authorities have publicly expressed concerns about the level of inflation and its deviation from the official target (see quotes above). Despite a slowdown in economic activity and a substantial tightening of policy inflation has not subsided. In recent months headline inflation has ticked up from 7.8 to 9.1 percent (12-month basis through October 2012). Moreover, core inflation has slowly crawled up, increasing from 7.0 to 9.1 percent between July 2011 and October 2012 (Annex Figure 1). This rise in inflation has prompted "moral suasion" actions by the authorities on supermarkets to freeze or reduce the prices of certain consumer goods.[5]

Inflation and Inflation Target in Selected Economies, 2011
(In percent)
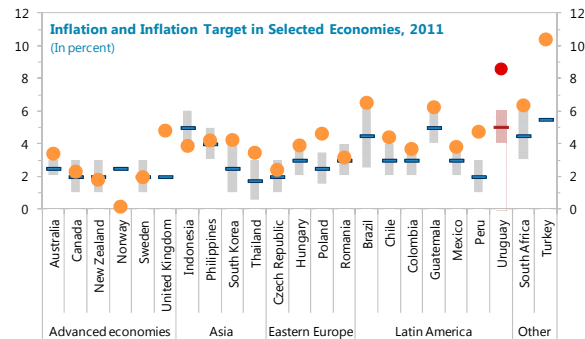
Source: Central Banks.
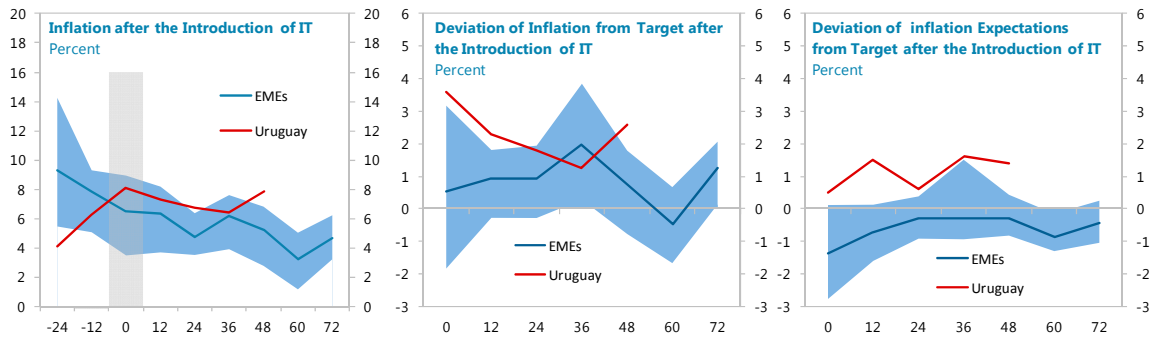Note: Bars show the official target ranges, with the horizontal line marking the mid-point. Dots show end-year inflation for 2011.

Inflation after the Introduction of IT
Percent

Deviation of Inflation from Target after the Introduction of IT
Percent

Deviation of inflation Expectations from Target after the Introduction of IT
Percent

Source: BCU, Central Banks, IMF-IFS, Haver analytics, IMF staff estimates.
Note: Inflation dynamics around the time of the introduction of inflation targeting. Horizontal axis: Months. Month zero corresponds to the start of inflation targeting. Shaded blue area corresponds to the 25th to 75th interquantile range of the distribution. The date of the introduction of inflation targeting in Uruguay is September 2007, which corresponds to the date when BCU started using the policy rate as instrument. Six month moving average for inflation dynamics. The following countries are included in the sample: Australia, Brazil, Canada, Chile, Colombia, Czech Republic, Guatemala, Hungary, Indonesia, Israel, Mexico, New Zealand, Norway, Peru, Philippines, Poland, Romania, South Africa, South Korea, Sweden, Thailand, Turkey, United Kingdom, and Uruguay.

[3] Inflation expectations come from the Banco Central del Uruguay's (BCU's) monthly survey, available since 2004. For the analysis in this paper that requires longer time periods, we rely more on inflation expectations reported by the survey firm Consensus Economics Inc., which date back to 2001 on a continuous basis.

[4] Inflation expectations have remained above the target slightly more than half of the time when the BCU expectation survey is used. Inflation expectations from Consensus Forecasts have been above target about one fifth of the time.

[5] The measures include an agreement with supermarkets to reduce the prices of 200 items by 10 percent, and freeze all other prices until year's end; a reduction in the price of meat and poultry; and a reduction of tax specific (IMESI) personal care items.

4.   **Reducing inflation and anchoring inflation expectations is important for several reasons.** Entrenching stable inflation and inflation expectations within the target range would better support the process of de-dollarization in the economy, lower the cost of public debt in local currency, promote financial deepening, and reduce the need for indexation in the economy for financial contracts and wages. It would also create more space for easing monetary policy in response to an economic downturn or strong capital inflows.[6]

5.   **So why are inflation and its expectations stuck above target?** As we will discuss below, our main conclusion is that despite the monetary tightening seen over the past two years in the form of policy rates, higher reserve requirements, or the introduction of marginal reserve requirements, the monetary policy setting has remained, as in other countries, cautious about downside risks associated with global conditions, financial stability considerations, buoyant capital flows and concerns about large exchange rate movements. Unfortunately, for Uruguay it has also coincided with widespread wage indexation practices, and has taken place at an early stage of the introduction of the IT regime, when inflation expectations have not yet converged to the target and the perception by the private sector about the commitment to inflation target has not been fully established. As a result, inflation and its inflation expectations have slowly been crawling up.

6.   **The rest of the paper is organized as follows.** Section B examines the monetary policy stance by comparing the interest rate behavior with that predicted by Taylor-rules. Section C then examines whether inflation expectations are well anchored or not. Next, Section D takes a closer look at the main drivers of inflation by estimating a Philips curve. With these elements in place, Section E examines potential changes to the communication framework to help BCU's control over inflation expectations. A final section concludes.

B.   The Monetary Policy Stance

7.   **The central bank of Uruguay (BCU) has tightened monetary policy over the past two years.** It raised the policy rate by a cumulative 275 basis points, increased average reserve requirements, and introduced marginal reserve requirements (Annex Figure 1).

8.   **Has this tightening aligned the monetary policy stance with the inflation goals?** To answer this question we estimate a Taylor-type interest rate rule using quarterly data over the period 1997–2012. In addition, we calibrate a Taylor rule with standard coefficients used in the literature (Taylor, 1993). The assessments based on these rules are complex given the uncertainty about which assumption to use for some parameters (e.g. the level and growth

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[6] Moreover, rating agencies—which have praised the solid fundamentals of the Uruguayan economy and have recently granted the country an investment grade sovereign debt rating— have warned that inflation is a factor that sets a ceiling for future upgrades (Moody's Investor Service, 2012).

rate of potential GDP, long-term inflation expectations, or their corresponding weights in the rule), nonetheless they provide a useful benchmark to assess the stance of monetary policy.

9.   **The estimated specification is as follows:**

$$i_t = \alpha + \rho(L)i_{t-1} + \beta[E_t(\pi_{t+4}|I_t) - \pi^*] + \gamma[E_t(y_t - y_t^*)] + \varepsilon_t \qquad (1)$$

Where i_t is the monetary policy interest rate in period t, $E_t(\pi_{t+4}|I_t)$ is the expected 4-quarter ahead CPI inflation, π^* the inflation target, $E_t(y_t - y_t^*)$ is the expected output gap, with y* denoting potential output, defined as the Hodrick-Prescott (HP) trend.[7] Finally, $\rho(L)$ is a lag operator. The interest rate rule is estimated using instrumental variable-general method of moments (IV-GMM) and includes two lags of the interest rate (see Clarida, Gali and Gertler, 1998 and 2000). Three lags of all the independent variables and the interest rate are used as instruments. This approach deals with possible endogeneity bias as forward-looking variables are obtained from a linear combination of lagged variables (i.e. the instruments). Estimates are reported in Table 1. As reported the policy rule satisfies the Taylor principle (according to which the optimal policy response to a rise in inflation is to increase interest rates sufficiently so as to induce an increase of real interest rates).

Table 1. Interest Rate Rule - IV GMM Regression

Dependent variable: policy rate

β	γ	$\rho(1)$	$\rho(2)$	α
1.56	0.52	0.60	-0.02	-8.29

Source: Fund staff estimates.

10.   **A standard Taylor rule is also calibrated.** Specifically, we calibrate a rule of the form $i_t = c + \alpha(\pi_t - \pi^*) + \beta(y_t - y_t^*)$, where c is the real neutral rate calculated as the sum of the upper limit of the official target range (6 percent) and potential real GDP (4 percent), while α and β are calibrated to be 1.5 and 0.5 (a similar calibration is done in BIS, 2010).

11.   **The results suggest that the actual policy rate has been systematically below the policy rate implied by the rules during the period that followed the 2008–09 global economic crisis.** Moreover, during this period, inflation expectations have consistently been above the target.[8] The gap between the predicted and the actual policy rate might be attributable to factors that are ignored in this mechanical rule (see the discussion below). The

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[7] The policy interest rate has a short history in Uruguay and is only available for the past five years. Thus, we constructed a hybrid series using a market rate from IMF-IFS.

[8] Although we take the center of the target as a reference of this deviation, results would carry over should the ceiling or the floor of the target range were used.

widening gap is mainly the result of a sustained increase in the estimated rule-based rate that was not accompanied by increases in the actual rate. This finding is in line with those of Magud and Tsounta (2012) based on a wide array of methodologies.
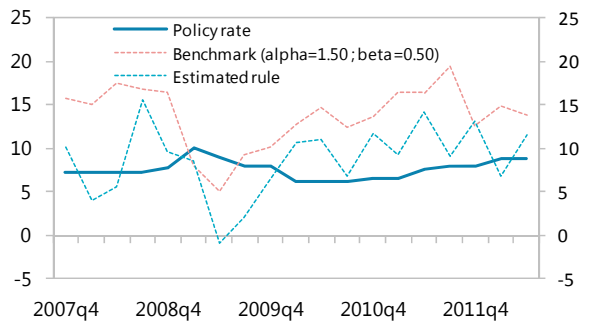
Actual and benchmark policy rates
Percent

Source: IMF Staff estimates.
Note: The benchmark interest rate rule is calculated as $i=c+\alpha*(pi-pi*)+\beta*y$, where c is the upper limit of the inflation target range (6 percent) plus potential real GDP growth (4 percent). The estimated rule is obtained by regressing the policy rate on its two lags, inflation expectations, and the output gap, over the period 1997Q1-2012Q2 as in Clarida, Galí, and Gertler, 2000.

12.   **But why has the interest rate gap widened after the 2008–09 crisis?** In Uruguay, monetary policy has sought to balance inflation objectives with economic developments, including concerns about exchange rate appreciation.[9] Such a widening is not exclusive to Uruguay; many other IT countries (e.g. Mexico and Brazil) have also seen such widening (see, for example, BIS, 2010; Magud and Tsounta, 2012, Taylor, 2012; and Hofmann and Bogdanova, 2012). For many of these countries, this widening has to do with the economic uncertainty related to the global crisis and the need to balance inflation objectives with other objectives—e.g., financial stability, growth, capital flows, and the exchange rate (Borio, 2012; BIS, 2010; Magud and Tsounta, 2012; Taylor, 2012; and Tovar, 2010). However, in most of these countries inflation and its expectations are relatively well anchored within the target range.

13.   **A policy rate persistently below the rule could de-anchor expectations**. We examine this question in the next section.

Interest rate gap and the deviation of inflation expectations from target 1/
Percent

Interest rate gap and the deviation of inflation expectations from target 1/
Percent

Source: BCU, IMF staff estimates.
Note: Red diamonds depict the period 2007Q4-2009Q3; Blue diamonds depict the period 2009Q4-2012Q2.
1/ Interest rate gap defined as the difference between the actual policy interest rate and an estimated/calibrated Taylor interest rate rule. The deviation of inflation expectations is measured relative to the center of the target range.

C. Are Inflation Expectations Well Anchored?

14.   **For inflation expectations to be well-anchored, they need to be aligned with the inflation target and the underlying process of expectations must be independent of**

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[9] Some of the recent COPOM communiques stated that the BCU remains vigilant of the main policy rate decisions adopted by other central banks.

actual and lagged inflation. We evaluate these conditions empirically through a basic set of complementary analysis that assesses (i) whether inflation expectations and inflation dynamics are disconnected; and (ii) whether inflation expectations are anchored (or partly anchored) around a specific level (see Annex I for technical details).

Table 2. Are Inflation Expectations Well-Anchored?

A.- Granger Causality Wald Tests

Dependent variable	Excluded variable	χ^2	$Prob > \chi^2$
π_t^e	π_t	0.87	0.34
π_t	π_t^e	0.97	0.32

B.- Anchor level

$$\pi_t^e = \lambda\pi^* + (1 - \lambda)\pi_{t-1}$$

$\pi^* = 7.00$	$\lambda=0.84$

Source: Fund staff estimates.
Note: Estimates for 2004-2012. Granger causality tests based on 1 lags as determined by AIC, HQIC and SBIC information criteria. The anchor level and the degree of credibility are estimated as described in the Annex A.1.

15.   **The findings suggest that inflation expectations are influenced by actual inflation and they fluctuate around 7 percent.** First, Granger causality tests suggest that inflation expectations are not completely disconnected from inflation dynamics—as we are unable to reject the null hypotheses that inflation does not Granger cause inflation expectations (Table 2, Panel A). Second, a complementary analysis (see Annex I for details) that examines whether inflation expectations can be described by a weighted average of a constant target, π^*, and past inflation finds that inflation expectations fluctuate around a level —7 percent—that exceeds the ceiling of the inflation target range. Moreover it also finds —in line with the Granger causality test— that inflation expectations are influenced by lagged inflation dynamics (Table 2, Panel B).

D.   Disentangling the Underlying Sources of Inflation Dynamics

16.   **What are the underlying sources of inflation in Uruguay?** Specifically, to what extent are expectations, lagged inflation, and costs driving inflation? We frame this discussion in terms of whether inflation dynamics are the result of (i) the dependence of inflation on its own past ("*intrinsic persistence*"); (ii) the formation of expectations ("*expectations-based persistence*") or (iii) fluctuations in the determinants of inflation, such as the output gap or marginal costs ("*extrinsic persistence*").[10] Disentangling these sources of inflation is complicated, as they are endogenous, and their relative importance also depends

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[10] The uncertainty about central bank policies can be a source of inflation (Altissimo et. al., 2006)

on the monetary policy regime and the policy reaction function (Fuhrer, 2011, and Altissimo et al., 2006).

17. **The roles of these factors are evaluated by estimating Phillips curves for Uruguay.** Regressions are run using quarterly data over the period 2004–12 (we also report estimates for 1997–2012 for completeness) using the Generalized Method of Moments to address potential endogeneity problems, as in Gali and Gertler (1999).[11] Specifically, we estimate a New Keynesian Phillips Curve (NKPC) formally summarized as follows:

$$\pi_t = \gamma E_t \pi_{t+i} + \delta \pi_{t-1} + \kappa x_t + \varepsilon_t \qquad (2)$$

Where the variables include lagged headline inflation, π_t; 12-month ahead Consensus Forecasts' inflation expectations, $E_t \pi_{t+i}$; and a measure of the output, unemployment gap, or marginal costs, x_t, which we capture by the percentage deviation of quarterly real GDP or of quarterly unemployment from its trend—as obtained from a Hodrick-Prescott filter.[12] Marginal costs are proxied using real wages and the output gap (see Celasun, 2006). We proxy cost push shocks by the deviation of headline inflation from core inflation and the deviation of the real exchange rate from its underlying trend—which captures also for the relative price of tradables to non-tradable goods. Variables are instrumented using one to three lags of the variables. As is standard, all variables are de-meaned.

18. **Results confirm that both *intrinsic* and *expectation-based* persistence are important in driving inflation dynamics.** The coefficient for lagged inflation remains at just over 0.5 and inflation expectations have the correct sign and a magnitude similar to that of the coefficient for lagged inflation (Model 1 in Table 3). These results contrast somewhat with those reported by Gelos and Rossi (2008), who find inflation expectations to be the main driver of the inflation process during 1998–2006, with a limited role for lagged inflation. To some extent this is expected given the time period covered by their study, which includes the 2002 crisis. It is plausible that during crises episodes agents reassess their expectations and become more forward-looking. Our results, which focus on the post-crisis episode, suggest that the role of inflation expectations in driving inflation has become somewhat less robust. It also suggests that the effectiveness of monetary policy may be hampered by the *intrinsic* inflation persistence.

19. ***Extrinsic persistence,* as captured by the output gap and real wages, is statistically significant (Models 1 and 3 in Table 3).** The role of real wages is quite relevant given the degree of wage indexation. Results are somewhat less satisfactory when using the unemployment gap, which turns out to be statistically insignificant in the most

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[11] See Nason and Smith (2008) for a detailed overview of the estimation of Phillips curves in single equations.

[12] 18-month ahead inflation expectations reported by the BCU survey were also used, but the sign on the coefficient consistently had the wrong sign. They are not reported.

recent sample, but quite relevant for the longer sample. Also, of the two cost-push shock measures, only the real exchange rate measure is significant (with real exchange rate appreciations contributing to lower inflation). The deviation of headline from core inflation did not result in significant results and are not reported.

Table 3. Phillips Curve Estimates[1]

Variable	2004Q1-2012Q2		1997Q1-2012Q2	
	1	2	3	4
Lagged CPI	0.55 ***	0.57 ***	0.52 ***	0.62 ***
Inflation expectations	0.50 *	0.20	0.39 ***	0.36 **
Output gap	0.26 **		-0.44 ***	
Unemployment gap		-0.08		-0.94 ***
Real Wages	16.81 ***	7.64 *	5.4	5.94
Exchange rate overvaluation	-0.09 *	-0.04 *	-0.01	-0.04
Constant	0.66	0.22	0.57 ***	0.21 ***
R^2	0.58	0.61	0.88	0.88

Note: Statistical significance * $p<0.05$; ** $p<0.01$; *** $p<0.001$
Source: BCU, INE and Haver Analytics. Fund staff estimates.
[1] Sample ends in 2012Q2.

20.   **Our analysis suggest that the inflation process in Uruguay is driven by both past and expected inflation**. Moreover, inflation is influenced by costs, in particular the degree of spare capacity (as captured by the output gap) and labor costs (as captured by wages). In recent years, up to 90 percent of collective wage agreements include clauses with ex-post corrections for the deviation of actual from expected inflation (Melgar et. al., 2011). This is likely to have feedback effects on inflation and its expectations. Although our model does not have a formal test for assessing the relevance of wage indexation on inflation, its effects are captured by the coefficient on lagged inflation in a similar way that wage indexation was captured by lagged inflation in the wage Phillips curve estimated by Melgar et al., (2011). Overall, wage indexation may help explain why lagged inflation remains an important driver of inflation dynamics. Finally, the exchange rate is found to have an effect on inflation. In particular, it appears that a narrowing but persistent undervaluation of the real exchange rate since 2002–03 has contributed to higher inflation.

E.   What Can Be Done to Strengthen the Monetary Policy Framework?

21.   **The BCU could improve further some aspects of the monetary policy framework to increase its influence over inflation expectations.** In this regard, BCU could consider to:

- **Communicate in a clearer manner the likely future direction of monetary policy.** Open and transparent communication can enhance policy effectiveness. It has become standard practice for central banks under inflation targeting regimes to indicate the

rationale behind policy actions and the expected outcomes, and to give forward guidance on future policy actions. Although BCU has made important progress in some of these areas, it could strengthen its guidance on future policy actions by publishing in its statements a more detailed assessment of its "bias" with respect to future changes in monetary policy. This would help the BCU influence inflation expectations better.

- **Publish its conditional forecasts of inflation along with an explanation of the risks surrounding the forecast.** Most inflation targeting countries publish an inflation forecast, usually quarterly, and many even publish core inflation forecasts (Hammond, 2012; Fracasso, et al 2003). Publishing inflation forecasts would help the BCU communicate to the public its views about future inflation and how it will converge to the target range.[13]

- **Ensure timely communication with the market.** More frequent meetings of the monetary policy committee (COPOM) could also help provide better guidance to the market about the stance of monetary policy and future policy directions, and thus help anchor inflation expectations around the target. BCU has four policy committee meetings a year, almost half the number in other inflation targeting countries in the region and the rest of the world.[14]

Decision Making at Central Banks
Number of policy committee meetings per year
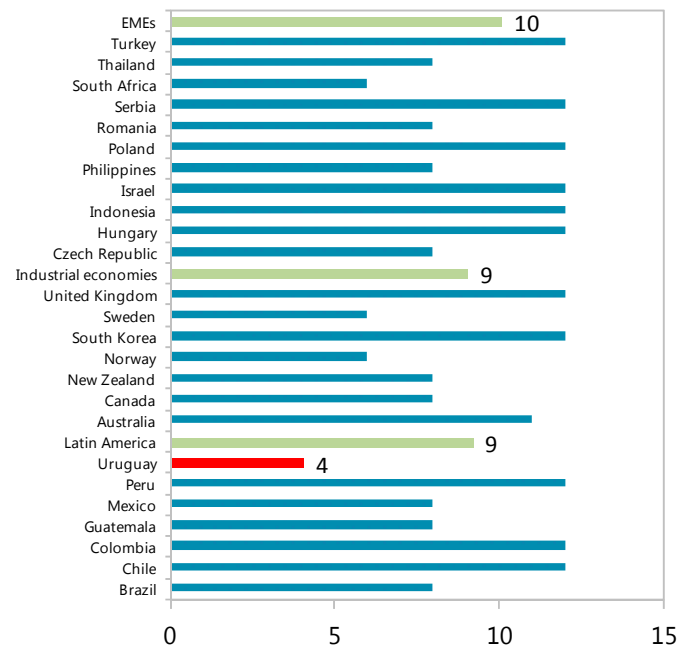
Source: IMF Staff on the basis of Hammond (2012).

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[13] When a central bank sets policy, it can assure its accountability in two manners. First by comparing inflation outcomes with the targets; and, second, by providing the public with a convincing rationale for the policy choices it makes (Bernanke et al.,1999). Accountability matters, because inflation responds to policy only with long lags and, in the case of Uruguay, because targets have been rarely hit.

[14] In the past the COPOM used to meet with a monthly frequency, but this was lowered to once every six weeks in March 2008 and later in 2009 to four meetings per year. Although possibly a mere coincidence, it is worth reminding that it is precisely at this point that inflation and its expectations start to deviate from its target.

F. Conclusions

22.   **Uruguay's inflation and inflation expectations exceed the inflation target and the gap has been widening in recent years.** This paper has argued that one reason for this increasing gap is that the stance of monetary policy has deviated from that implied by the Taylor rule as well as a rule estimated for Uruguay using past data.

23.   **To help bring inflation and its expectations to the mid-point of the target BCU needs to maintain a tightening bias.** The tightening pace should depend on the evolution of the economy, including the output gap, credit dynamics, and the exchange rate.

24.   **In addition, the BCU could also strengthen its communication.** It can take a more determined, clear, and transparent '*action path*' that explains how inflation *will be brought* to the center of the target range. Given the widened deviation of inflation from target, bringing inflation and its expectations back to the center of the target range might be somewhat more demanding today than a few years ago. Thus, in addition to a continued tightening of the monetary policy stance, and stronger monetary policy communications, concerted effort on other fronts—including prudent wage increases and counter-cyclical fiscal policy would also be helpful.

ANNEX I. ASSESSING IF INFLATION EXPECTATIONS ARE ANCHORED

1.   For inflation expectations to be anchored there must be a disconnect between inflation and inflation expectations dynamics. This can be tested by examining coefficients on a bivariate VAR of inflation and inflation expectations. Formally,

$$\begin{pmatrix} \pi_t \\ \pi_t^e \end{pmatrix} = \begin{pmatrix} c_1 \\ c_2 \end{pmatrix} + \begin{pmatrix} a(L) & b(L) \\ c(L) & d(L) \end{pmatrix} \begin{pmatrix} \pi_{t-1} \\ \pi_{t-1}^e \end{pmatrix} + \begin{pmatrix} \epsilon_1 \\ \epsilon_2 \end{pmatrix} \qquad \text{(A.1)}$$

Where

$$\begin{pmatrix} \epsilon_1 \\ \epsilon_2 \end{pmatrix} \sim \text{i.i.d.} \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{11} & \sigma_{12} \\ \sigma_{21} & \sigma_{22} \end{pmatrix} \right). \qquad \text{(A2)}$$

2.   One can then conjecture that inflation expectations would be credibly anchored, would require (i) the expected inflation to be unrelated to lagged inflation i.e. $c(L) = 0$; (ii) expected inflation to be anchored to a constant i.e. $c(L) = 0$ and $d(L) = 0$; (iii) Actual inflation to be unaffected by inflation expectations, i.e. $b(L) = 0$; (iv) the persistence of inflation (i.e. the sum of $a(L)$ should decline with credibility; and, finally, (v) there should be no contemporaneous transmission of shocks from actual to expected inflation and viceversa, i.e. $\sigma_{12} = 0$.

3.   Empirically, hypothesis (i) and (ii) can be tested with Granger causality tests. Hypothesis (iii) can be examined through impulse response dynamics. While hypothesis (i),(iii), and (v) can be tested by examining whether the impulse responses are all zero. Hypothesis (iv) is left unexamined as it requires comparing different periods of credibility.

4.   An alternative is to examine whether inflation is explained only by a time invariant component, or whether it also includes a time variant component. Formally this can be written as a weighted average of a constant target, π^*, and last period's inflation rate (see Bomfim and Rudebusch, 2008):

$$\pi_t^e = \lambda_t \pi^* + (1 - \lambda_t) \pi_{t-1} \qquad \text{(A.3)}$$

where $\lambda_t \epsilon [0,1]$ measures the degree to which expectations are anchored.

5.   Thus for a central bank to be perfectly credible two conditions should be met. First, π^* should equal the central bank target, and second, $\lambda_t = 1$, as this would imply that inflation expectations are perfectly anchored to the constant π^*. In addition two additional situations can occur. If π^* does not equal the central bank target one could conclude that the central bank target is not credible or that inflation has not yet converged to the target. Also λ_t might differ from 1. In the extreme case that $\lambda_t = 0$ inflation would simply be explained by its past dynamics, indicating that expectations are not anchored to any level. Finally, any value of λ_t between zero and one would imply that expectations are partly anchored to a certain level π^*.

6.   To test this empirically we can rewrite the above condition as:

$$\pi_t^e = \lambda\pi^* + (1 - \lambda)\pi_{t-1} \tag{A.4}$$

7.   If we assume a dynamic specification for inflation expectations such as:

$$\pi_t^e = c_o + c_1\pi_{t-1} + \cdots + c_p\pi_{t-p} + d_1\pi_{t-1}^e + \cdots + d_p\pi_{t-p}^e + e_{pt} \tag{A.5}$$

Then λ and π^* can be estimated as follows:

$$\lambda = 1 - \frac{\sum_{n=1}^{n=p} c_n}{\sum_{n=1}^{n=p} d_n} \text{ and } \pi^* = \frac{c_0}{(1-\sum_{n=1}^{n=p} d_n)\lambda} \tag{A.6}$$

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Figure 1. Monetary Policy, Exchange Rates, Wage, and Inflation Dynamics
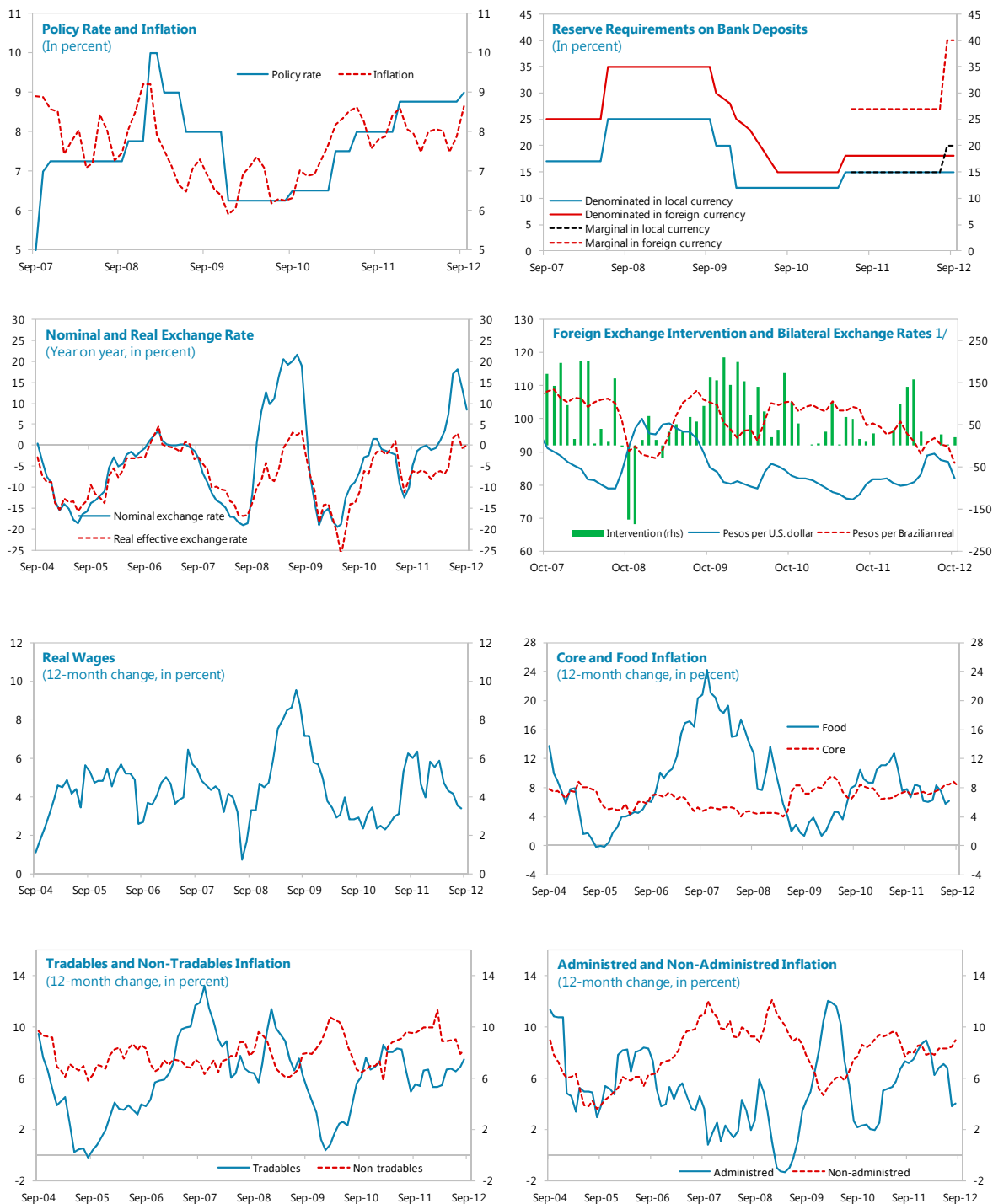
Sources: Banco Central del Uruguay and Fund staff calculations.
1/ Central Bank foreign exchange operations with the banking system (in millions of US dollars). The exchange rate indexes equal 100 in January 2007 (Positive values mean depreciation).

Table 4. Summary Statistics of Inflation and its Components, 2004–2012[1]

Variable	Mean	Std. Dev.	Min.	Max.	Persistence [1]
Headline	7.0	1.3	3.4	10.0	0.93
Core	6.6	2.1	1.4	12.0	0.90
Tradables	5.9	2.9	-0.2	12.4	0.94
Nontradables	7.7	1.2	5.6	10.7	0.84
Regulated	5.6	3.5	-1.3	13.8	0.94
Non-regulated	7.6	1.9	3.5	11.4	0.56

Sources: BCU. Fund staff estimates.
[1] Sample ends in April 2012.
[2] Autoregressive coefficient from an AR(1) process.

Table 5: Individual Countries Inflation Target

Country	Target Set By	Target Measure	Target 2012 [1]	Target Type	Multiple Targets	Target Horizon
Brazil	G and CB	H CPI	4.5 ± 2	P+T	2012 and 2013	Yearly Target
Chile	CB	H CPI	3 ± 1	P+T		Around two years
Colombia	CB	H CPI	2 - 4	Range		Medium term
Guatemala	CB	H CPI	4.5 ± 1	P+T	2012 and 2013	End of year
Mexico	CB	H CPI	3 ± 1	P+T		Medium term
Peru	CB	H CPI	2 ± 1	P+T		At all times
Uruguay	**G and CB**	**H CPI**	**4 - 6**	**Range**		**18-month**
Australia	G and CB	H CPI	2 - 3	Range		Medium term
Canada	G and CB	H CPI	2 (mid-point of 1-3)	P+T		Six-eight quarter; Current target extends to December 2016.
New Zealand	G and CB	H CPI	1 - 3	Range		Medium term
Norway	G	H CPI	2.5	Point		Medium term
South Korea	CB (with GB)	H CPI	3 ± 1	P+T		Three years
Sweden	CB	H CPI	2	Point		Normally two years
United Kingdom	G and CB	H CPI	2	Point		At all times
Czech Republic	CB	H CPI	2 ± 1	P+T		Medium term, 12-18 months
Hungary	CB	H CPI	3	Point		Medium term
Indonesia	G and CB	H CPI	4.5 ± 1	P+T		Medium term
Israel	G and CB	H CPI	1 - 3	Range		Within two years
Philippines	G and CB	H CPI	4 ± 1	P+T		Medium term (from 2012-2014)
Poland	CB	H CPI	2.5 ± 1	P+T		Medium term
Romania	G and CB	H CPI	3 ± 1	P+T		Medium-term target from 2013
Serbia	G and CB	H CPI	4 ± 1	P+T		Medium term
South Africa	G	H CPI	3 - 6	Range		On a continuous basis
Thailand	G and CB	H CPI [2]	3 ± 1.5 [2]	P+T	Target set annually	Eight quarters
Turkey	G and CB	H CPI	5 ± 2	P+T	2012 and 2013	Multi year (three years)

Source: Hammond (2012) and Central Banks.
Note: CB = Central Bank; G = Government; H CPI = Headline CPI; P+T = Point with tolerance band.
[1] In percentage points.
[2] Target proposed by central bank at start of 2012, pending cabinet approval.

Table 6: Decision Making in Inflation Targeting Central Banks

Country	Number on Policy Making Committee	External Members?	Meetings per Year	Governor's Term (years)	Decision Making Process	Votes Published?
Brazil	8	No	8	No Fixed Term	Vote	Balance of Votes
Chile	5	No	12	5	Vote	Yes
Colombia	7	No	12	4	Vote	Majority or Unanimous
Guatemala	8	7	8	4	Vote	No
Mexico	5	No	8	6	Consensus	n/a
Peru	7	No	12	Term of Parliament	Vote	No
Uruguay	**6**	**No**	**4**	**No Fixed Term**		**No**
Australia	9	6	11	7	Consensus	n/a
Canada	6	No	8	7	Consensus	n/a
New Zealand	Governor	n/a	8	5	Governor decides	n/a
Norway	7	5	6	6	Consensus	n/a
South Korea	7	5	12	4	Vote	No
Sweden	6	No	6	6	Vote	Yes
United Kingdom	9	4	12	5	Vote	Yes
Czech Republic	7	No	8	6	Vote	Yes
Hungary	5 to 9 [1]	4	12	6	Vote	Yes
Indonesia	6 to 9 [2]	No	12	5	Consensus	n/a
Israel	6	3	12	5	Vote	Balance of Votes
Philippines	7	No	8	6	Vote	No
Poland	10	9	12	6	Vote	Yes in Inflation Report
Romania	9	5	8	5	Vote	No
Serbia	5	No	12	6	Vote	No
South Africa	7	No	6	5	Consensus	n/a
Thailand	7	4	8	5	Vote	Balance of Votes
Turkey	7	1	12	5	Vote	No

Source: Hammond (2012) and Central Banks.
Note: CB = Central Bank; G = Government; H CPI = Headline CPI; P+T = Point with tolerance band.
[1] Currently 7.
[2] Currently 7.

Table 7: Accountability and Transparency in Inflation Targeting Central Banks

Country	Open Letter	Parliamentary Hearings?	Press Notice /Conference	Minutes	Votes	Inflation Report	Frequency
Brazil	Yes	Yes, six per year	PR+PC for IR	Yes, after eight days	Balance of votes	Yes	4
Chile	No	Yes, four times per year	PR	Yes, after two weeks	Yes	Yes	4
Colombia	No	Yes, twice yearly	PR, PC for IR	Yes, after two weeks	Majority or unanimous	Yes	4
Guatemala	No	Yes, twice a year	PR + PC	Yes, after four weeks	No	Yes	3
Mexico	No	Yes, not regularly	PR	Yes, after two weeks	n/a	Yes	4
Peru	No	Yes, once a year	Teleconference	No	No	Yes	4
Uruguay	**No**	**No**	**PC+IR**	**No**	**No**	**Yes**	**4**
Australia	No	Yes, twice yearly	Notice	Yes, after two weeks	n/a	Yes	4
Canada	No	Yes, twice yearly	PR+PC for IR	No	n/a	Yes	4
New Zealand	Other	Yes, four times per year	PR, PC for IR	No	n/a	Yes	4
Norway	No	Yes	PR + PC	No	n/a	Yes	3
South Korea	No	Yes	PR + PC	Yes, after six weeks	No	Yes	2
Sweden	No	Yes, twice yearly	PR	Yes, after two weeks	Yes	Yes	3 plus 3
United Kingdom	Yes	Yes, three per year	PR + PC for IR	Yes, after two weeks	Yes	Yes	4
Czech Republic	No	No (Report)	PR, PC for IR	Yes, after eight days	Yes	Yes	4
Hungary	No	Yes, once a year	PC	Yes	Yes	Yes	4
Indonesia	No	No	PR	No	n/a	Yes	4
Israel	No	Yes, twice yealry	PR	Yes, after two weeks	Balance of votes	Yes	2
Philippines	Yes	No	PR + PC	Yes, after four weeks	No	Yes	4
Poland	No	No	PR + PC	Yes, after three weeks	Yes in Inflation Report	Yes	4
Romania	No	No	PR + PC for IR	No	No	Yes	4
Serbia	Yes	No	PR + PC	No	No	Yes	4
South Africa	No	Yes, at least three per year	PR + PC	No	n/a	Yes	2
Thailand	Yes	No	PR + PC	Yes, after two weeks	Balance of votes	Yes	4
Turkey	Yes	Yes, twice a year	PR	Yes	No	Yes	4

Source: Hammond (2012) and Central Banks.
Note: IR = Inflation Report; PC = Press conference; PR = Press release.

II.   FDI IN URUGUAY: RECENT TRENDS AND DETERMINANTS[15]

A.   Introduction

1.   **Foreign Direct Investment (FDI) is considered to be an important vehicle for raising long-term growth prospects in developing countries.** FDI bolsters growth prospects by transferring technology, increasing productivity, and increasing the capital stock. In addition, FDI is generally considered to be more stable than other capital flows. FDI to Uruguay has increased markedly in the past several years, more than financing the current account deficit. Most of it has gone to the agriculture and construction sectors.

2.   **This paper documents key stylized facts of FDI flows to Uruguay in a cross country context.** In particular, it looks at whether the composition of FDI is in line with the predictions of the existing literature. The paper is organized as follows. Section II reviews the trends in FDI flows to Uruguay for the past decade; Section III and IV summarize the previous literature on the determinants of FDI volumes and composition, and how Uruguay and other countries in the region compare on them, and Section V concludes.

B.   Stylized Facts

3.   **FDI flows to Uruguay increased substantially in the second half of the last decade, averaging 6 percent of GDP per year.** This was higher than the 2 percent of GDP per year in the previous five years, and above the average (4 percent of GDP) for LA5 countries (Brazil, Chile, Colombia, Mexico, and Peru) in the same period. It was also higher than the FDI flows to emerging market economies in Asia (Figure 1).

4.   **The nontradables sector accounts for a higher share of FDI in Uruguay compared with other countries in the region.** About 40 percent of the FDI inflows to Uruguay in 2005-10, went to the tradable sectors and 60 percent to non-tradable sectors.[16] The corresponding shares for the rest of the region was 59 percent and 41 percent, respectively. The construction sector, which includes real estate investments in Punta del Este, has been one of the most attractive activities for

Uruguay: FDI by Origin, average 2006-2010

Country	Millions of U.S. dollars	In percent of total
Argentina	442	25.2
Spain	119	7.0
Brazil	108	6.2
United States	77	4.8
Rest of Europe	99	5.9
United Kingdom	66	3.6
Other	838	47.3
Total	1749	100

Source: Banco Central de Uruguay, and Fund staff calculations.

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[15] Prepared by Camila Perez and Natalia Melgar.

[16] The classification of a sector as "tradable" or "nontradable" is not straightforward as many sectors contain elements of both. In this paper, we define tradable sectors as manufacturing, agriculture, mining, hotels and restaurants and non-tradable sectors are retail, construction, electricity, transport, communications, and financial intermediation.

FDI, receiving on average 25 percent of the total in the above mentioned period (Figure 1). This kind of investment has been very relevant in expanding the tourism industry, which should help generate higher tourism revenues in the future.

5.   **In line with the trend in Latin America,** *intra regional* **FDI into Uruguay has increased substantially in recent years.** The share of Uruguay's FDI coming from Latin American countries increased from 17 percent in 2001-05 to 33 percent in 2006-10. Most of the regional FDI comes from Mercosur countries, mainly Argentina, but also Brazil. European countries are still important investors, but their share has been declining since 2005, similar to European investments in the rest of the region.[17] FDI from Argentina has gone mainly to the agriculture and real estate sectors, while that coming from the United States and Europe has been directed mainly to the retail, finance, manufacturing, and construction sectors. Investment from Brazil has gone mainly to manufacturing, finance, and real estate.[18]

C.   Determinants of the Volume of FDI – How Does Uruguay Compare?

Review of literature on the determinants of FDI volumes

6.   **The determinants of FDI into a given country vary by investment type.** The literature generally considers three types of investment: *market seeking*, *resource-seeking* and *efficiency-seeking*. As discussed by Campos and Kinoshita (2003), *market seeking* investors are attracted to countries with large and fast-growing local markets, *resource-seeking* investors typically look for a country with abundant natural resources, and *efficiency-seeking* investors will weigh more heavily geographical proximity to the home country, for instance, to minimize transportation costs.

7.   **Agglomeration or "clustering" effects also affect FDI decisions.** Foreign firms appear to "cluster" either because of linkages between projects or because a large existing FDI stock is a signal of a good business environment for investors. In addition, there are positive spillovers and economies of scale for FDI in a country where other investors have already established. Campos and Kinoshita (2003) find evidence of this relationship in the transition economies of Central Europe and in the former Soviet Union.

8.   **Economic and political stability and the quality of infrastructure also influence FDI.** Campos and Kinoshita (2008) document that foreign investors are attracted to countries with a more stable macroeconomic environment, higher levels of economic development, and better infrastructure. Domestic conflict events and political instability have negative

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[17] See ECLAC, Foreign Direct Investment in Latin America and The Caribbean, 2010.

[18] See "Inward FDI in Uruguay and its Policy Context", by Graciana del Castillo and Daniel Garcia,Vale Columbia Center on Sustainable International Investment. August 2012.

effects on FDI (Arbatli, 2011), as do weak legal and political systems and meager infrastructure (Groh and Wich, 2012).

9.   **Specific trade and investment policies also influence FDI allocation.** The degree of trade openness might have a positive impact, especially in export oriented industries. Regional Trade Agreements (RTA) also appear to attract FDI, via a market size effect.[19] The positive impact of tax concessions on FDI is less clear: the benefits in terms of FDI appear to be limited, while the costs in terms of forgone revenue can be substantial (Chai and Goyal 2008).

10.   **More recent studies have documented that strong institutions help to attract FDI.** Dunning (2006) documents that the quality of the legal property system, the protection of intellectual property rights, a good institutional infrastructure and support (banking, legal, accountancy services), and legislation to reduce corruption -among other factors- have a positive effect on FDI. Campos and Kinoshita (2003) find that less corruption, a fair, predictable, and expedient judiciary, and an efficient bureaucracy help attract FDI.

How does Uruguay compare?

11.   **The surge in inflows in the last five years coincided with favorable macroeconomic and institutional conditions in Uruguay**. Uruguay ranks high in the region in terms of various investment and economic climate indexes (Table 1), in particular in terms of the functioning of the government and public institutions, macroeconomic stability, levels of corruption, the quality of the education system, and respect for property rights and business freedom. Some of the areas that present opportunities for improvement include: the quality of infrastructure, labor market efficiency, financial market development, and the level of investment in R&D and innovation.

12.   **A better ranking in investment climate indicators is normally correlated with high levels of FDI.** This holds true for the Latin America region. As shown in Figure 2, in general, countries in the region with higher FDI/GDP ratios rank better in the investment climate indexes.

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[19] Jaumotte (2004) shows that countries with a relatively more educated labor force and/or a relatively more stable financial situation tend to attract a larger share of FDI at the expense of their RTA partners.

Table 1. Selected Business Environment Indicators

	Most Recent Score	Last Score	Position (sample size in parentheses)	Score Range
Doing Business (World Bank)	n.a. /1	n.a. /1	90 (174)	n.a. /1
Political Stability and Absence of Violence/Terrorism Index (World Bank)	77.36	75.83	44 (210)	0, 100
Global Competitiveness index (World Economic Forum)	4.13	4.25	74 (142)	0, 7
Economic Freedom index (Heritage Foundation)	69.90	70.00	29 (179)	0, 100
Legatum Prosperity index (Legatum Institute)	1.20	1.15	29 (110)	-10, 10
Corruption Perception Index (Transparency International)	7.00	6.90	25 (183)	0, 10
Global Democracy Index (Economist Intelligence Unit)	8.17	8.10	17 (167)	0, 10
Global Peace Index (Institute for Economics and Peace)	1.52	1.57	21 (149)	1, 5

1 / Only a ranking is available, there is no score.

D. Determinants of Sectoral Composition of FDI Inflows

Primary, secondary and tertiary sector FDI

13.   **Between 2005 and 2010, 23 percent of the total FDI flows to Uruguay went to the primary sector, 11 percent to the secondary sector and 45 percent to the tertiary sector.**[20] Uruguay ranks in the middle of a sample of regional economies in terms of the share of flows destined to the secondary and tertiary sectors. About half of the countries in the region have been receiving a larger level of flows into the secondary and tertiary sectors than Uruguay, and about half of the countries have been receiving less (Figure 1).

14.   **This section examines whether the composition of FDI in Uruguay as compared to other countries in the region is well explained by the findings of the literature.** For

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[20] Primary and secondary sectors—covering extractive and manufacturing industries, respectively—can be classified as tradable, while the tertiary (service) sector is non tradable, with the exception of hotels. Uruguay has a big portion of FDI classified under "other", to maintain statistical confidentiality.

that purpose, we use the results of Walsh and Yu (2010) on the determinants of sectoral composition of FDI in developing countries. Their paper uses annual FDI data for 27 advanced and emerging market countries, focusing mostly on the 1998-2008 period. In their model, the dependant variable is the inflow of FDI by sector, in percent of GDP.

- The explanatory *macroeconomic* variables include openness, the real exchange rate, inflation (as a proxy for macroeconomic stability), the stock of FDI (a measure of the degree of clustering), real GDP growth (a proxy of growth potential), and GDP per capita (a proxy of market size).

- The *institutional and structural* variables include: labor market flexibility[21], infrastructure quality, judicial independence, legal system efficiency, financial depth (measured as the credit to GDP ratio), and school enrollment.

15.   **Walsh and Yu (2010) find that the determinants of FDI vary by sector.** For developing countries they find:

- For FDI into the primary sector, macroeconomic and developmental variables have little impact on flows, because the performance of extractive industries (as mining and petroleum) is not necessarily related to the macroeconomic or institutional environment.

- For the secondary sector, a weaker real exchange rate, a higher FDI stock, as well as higher scores on labor market flexibility, infrastructure, and financial depth are associated with higher flows.

- Flows into the tertiary sector do not appear to be influenced by macroeconomic variables. For institutional variables, a more independent judiciary and better infrastructure quality are positively related to FDI.

16.   **Do the Walsh and Yu (2010) findings hold in the region?** As can be observed in figures 3a and 3b, a higher stock of FDI, more flexibility in the labor market, deeper financial penetration and a better quality of infrastructure are positively correlated with FDI inflows into the tertiary sector (but not necessarily to the secondary sector). A more independent judiciary is positively related to FDI in both sectors.

17.   **The findings of Walsh and Yu (2010) can help to explain the relatively high level of FDI flows into Uruguay's tertiary sector.** For example, Uruguay outperforms most other countries in the region in terms of judicial independence. Uruguay also performs well in

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[21] Labor market flexibility is measured by a hiring and firing cost index.

terms of hiring and firing costs. It also ranks highly in terms of infrastructure quality, which is positively correlated with FDI into the tertiary sector.

18.   **Uruguay could potentially attract more FDI to the secondary sector by further improving some structural aspects.** Figure 4 highlights some variables related to the business environment where Uruguay could improve further, broadening the set of indicators used by Walsh and Yu (2010):

- **Labor market flexibility**: Uruguay underperforms in indicators of labor market flexibility other than hiring and firing costs. It ranks 136th (out of 144 and compared to 118 in the previous year) in the labor market efficiency ranking of the Global Competitiveness Report (GCR). For the subcomponent of wage flexibility, Uruguay has the lowest ranking. The cooperation in labor-employer relations ranking (136 out of 144) is the third lowest in the region.

- **Financial depth**: The ratio of credit to GDP for Uruguay is below the average for the region. Uruguay's financial market development ranking from the GCR was 90 (out of 144) in 2012 (79 in the previous year). The subcomponent of availability of financial services has a ranking of 94 (it was 87 in 2011), while the index capturing financing through local equity market is in position 134. For credit market regulations (a subcomponent of the Index of Economic Freedom) Uruguay has the lowest score in the region after Brazil[22].

- **Infrastructure quality**: Uruguay ranks 49 (out of 144, and the same as last year) in the overall infrastructure index of the GCR. But while it outperforms in the subcomponent of electricity and telephony, it underperforms in transport, in particular in the quality of roads and railroads.

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[22] This indicator is a sub-index of the Regulation of Credit, Labor and Business dimension of the Index of Economic Freedom. The indicator ranges from 0 to 10 with a higher score indicating lower levels of regulation of credit markets. It is comprised of several component indices, including ownership of banks, percentage of deposits held in privately owned banks, competition domestic banks face competition from foreign banks, extension of credit, percentage of credit extended to private sector, avoidance of interest rate controls and regulations that lead to negative real interest rates; interest rate controls, interest rate controls on bank deposits and/or loans freely determined by the market.

FDI into the tradable sector and exports

19.   **Cross-country evidence suggests a positive relationship between tradable FDI and export prices.** Kinoshita (2011) suggests that this could reflect that countries with a profitable exporting sector are more likely to attract FDI in the tradable sector. In addition, she shows that FDI in the tradable sector is associated with higher exports. High FDI into Uruguay's tradables sector has coincided with strong growth in Uruguay's export prices. In addition, some of Uruguay's most dynamic exporting primary sectors in the past three years, agriculture and forestry, have received significant FDI. The food and beverages sector also received significant investment and posted increases of export values of 13 percent per year on average since 2007.

Tradable FDI vs. Export Prices (2005-2010)

$y = 0.0891x + 1.4053$
$R^2 = 0.0997$
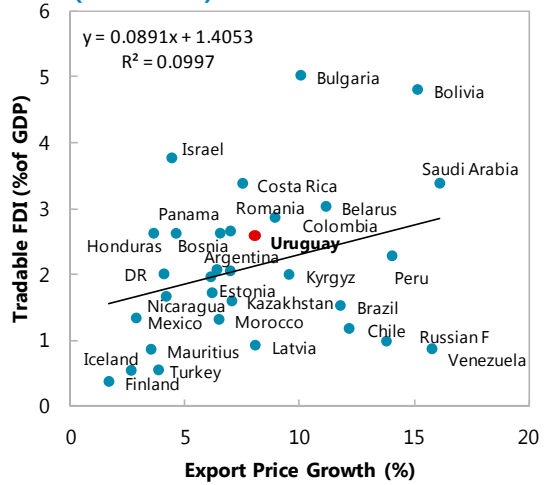
E.   Conclusions

20.   **This paper examined the factors behind the composition of FDI flows to Uruguay, building on results from previous empirical studies**. The analysis suggests that Uruguay's strong institutions and macroeconomic stability have played an important role in attracting FDI to the secondary and tertiary sectors. Some other indicators, in particular related to the flexibility of the labor market, financial deepening and the quality of infrastructure suggest further room for improvement, in order to diversify the destination of FDI flows.

Export Growth vs. FDI Flows by Sector
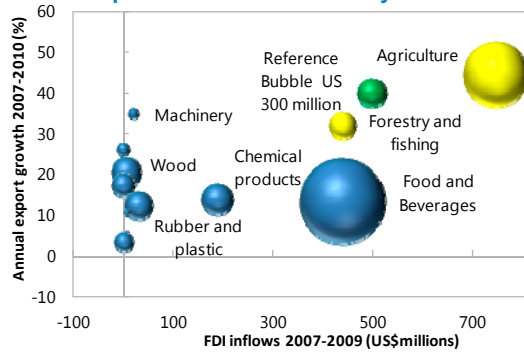
Note: Bubble size is proportional to export value in 2010. Primary sectors are indicated in yellow and secondary sectors in blue.
Source: UNCTAD, BCU, WEO, Fund staff calculations.

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Box 1. Selected FDI projects in Uruguay

Uruguay has major ongoing and planned project in pulp, petroleum exploration and renewable energy.

The Montes del Plata pulp mill plant, a joint-venture between Arauco (Chile) and Stora Enso (Sweden-Finland), is the biggest private investment project in the history of Uruguay. With an estimated cost of US$1.9 billion, the construction phase is expected to last two years, including the cellulose plant, the port, and the energy plant. Approximately US$1.3 billion of the total cost will finance imports, and the impact on GDP during the construction period is estimated at 0.8 percent.

The plant will begin to operate in 2013 and will generate around U$770 million of additional annual exports (around 2 percent of GDP). In addition, it will create 500 jobs directly and 800 jobs indirectly.

Petroleum exploration will start in 2013. In October 2012, state oil company (ANCAP) signed the contracts with four companies: British companies BG and BP, French company Tottal, and Irish company Tullow Oil. The total investment is estimated at US$1.6 billion and will be made during the following three years.

Hydropower is currently the main source of energy, but the diversification of energy sources continues. Actual installed capacity is 2,700 Megawatts (MW). The government is planning to increase the energy matrix by 2,400 MW by 2015 (1,240MW wind power; 500MW interconnection with Brazil; 500MW combined cycled plant crude and natural gas; 200MW biomass). Total investment will add up to about US$6 billion.

Figure 1. Uruguay and the region: Foreign Direct Investment

FDI inflows to Emerging Markets
(In percent of GDP)

- Uruguay
- LA5 1/
- EM Asia
- EM Europe
- EM Africa

FDI flows by Sector 2005-2010
(In percent of total FDI)

- Nontradable
- Hotels and Retail
- Tradable

Bolivia, Colombia, Argentina, Brazil, Mexico, Peru, Chile, DR, Uruguay

FDI by Sector
(In billions of U.S. dollars)

- Other
- Retail
- Manufacturing
- Construction
- Agriculture

FDI Composition by Sector 2005-2010
(In percent of total)

- Tertiary
- Secondary
- Primary

Mexico, Costa Rica, Nicaragua, Honduras, Brazil, Guatemala, Uruguay, Argentina, Chile, Peru, Colombia, Bolivia

Mergers and Acquisitions vs Greenfield Projects
(In billions of U.S. dollars)

- M&A
- Greenfield projects

FDI Financing
(In billions of U.S. dollars)

- Capital
- Profit reinvestment
- Net lending

Sources: Banco Central del Uruguay, Economic Comission for Latin America and the Caribbean and Fund staff calculations.
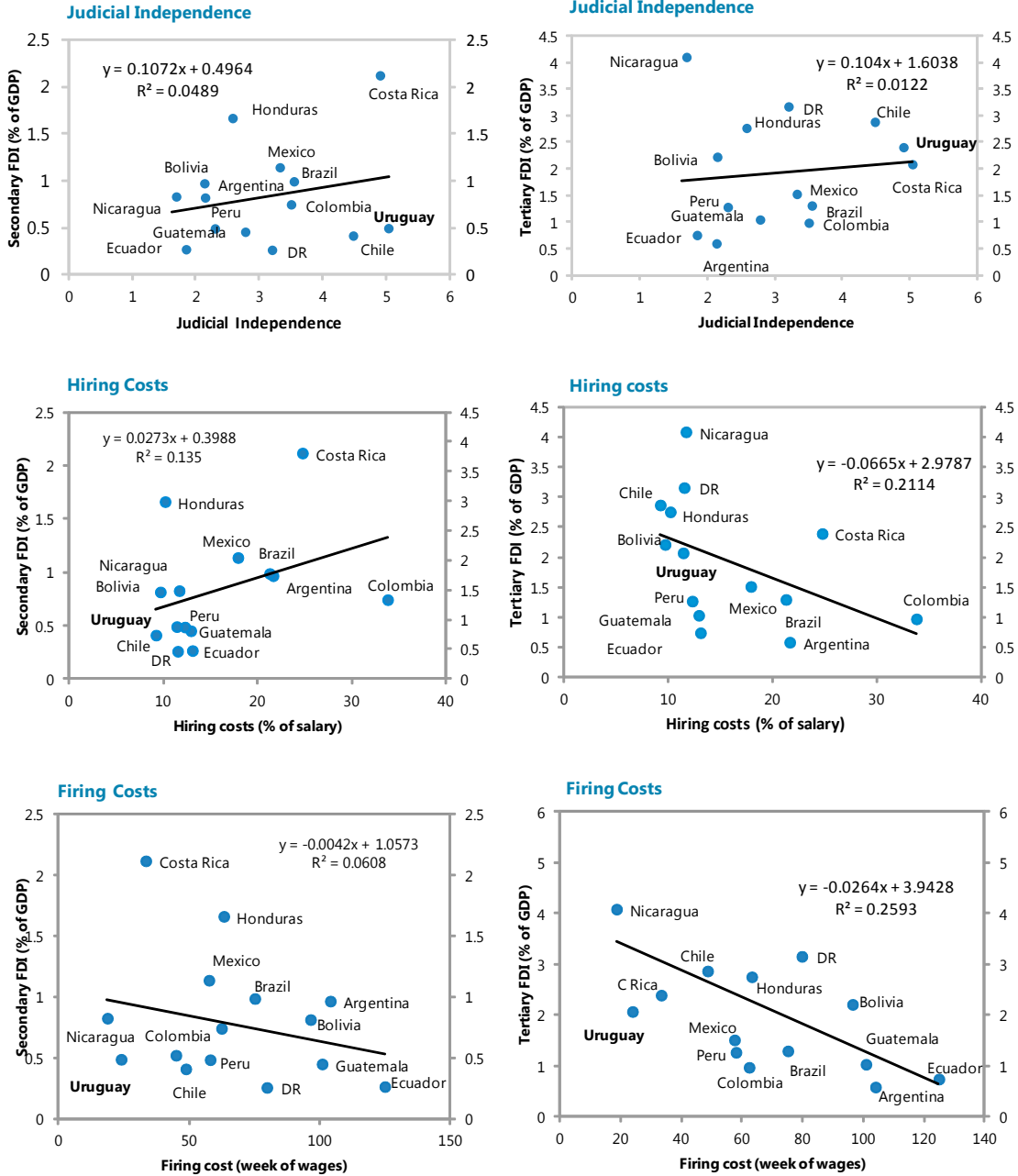
1/ Brazil, Chile, Colombia, Mexico, and Peru.

Figure 2. Business Environment Indicators and FDI
(in percent of GDP, 2005-2010)

Ease of Doing Business

$y = -0.0138x + 5.7238$
$R^2 = 0.0543$

FDI (% of GDP, average 2005-2010)

Chile, Nicaragua, Uruguay, Peru, Costa Rica, Colombia, Dominican Republic, Argentina, Mexico, Brazil

Ease of Doing Business Rank

Getting Electricity

FDI (% of GDP, average 2005-2010)

Uruguay, Chile, Nicaragua, Costa Rica, Colombia, Argentina, Peru, Dominican Republic, Brazil, Mexico

$y = -0.0521x + 5.5624$
$R^2 = 0.0741$

Getting Electricity Rank

Corruption Perception

FDI (% of GDP, average 2005-2010)

Chile, Nicaragua, Uruguay, Costa Rica, Peru, Dominican Republic, Colombia, Brazil, Mexico, Argentina

$y = -0.0166x + 5.7401$
$R^2 = 0.0958$

Corruption Perception Rank

Global Competitiveness

FDI (% of GDP, average 2005-2010)

Chile, Uruguay, Nicaragua, Peru, Costa Rica, Colombia, Mexico, Brazil, Argentina, Dominican Republic

$y = 0.0021x + 4.4189$
$R^2 = 0.0007$

Global Competitiveness Rank

Political Stability

FDI (% of GDP, average 2005-2010)

Nicaragua, Chile, Uruguay, Costa Rica, Peru, Colombia, Brazil, Mexico, Argentina

$y = -0.0421x + 8.1261$
$R^2 = 0.4758$

Political Stability Rank

Economic Freedom

$y = -0.0274x + 6.4183$
$R^2 = 0.2775$

FDI (% of GDP, average 2005-2010)

Chile, Uruguay, Nicaragua, Costa Rica, Peru, Dominican Republic, Colombia, Argentina, Mexico, Brazil

Economic Freedom Rank

Note: The x-axis refers to the rankings, in all cases a lower number implies a better performance (as it means a higher position in the ranking of countries).
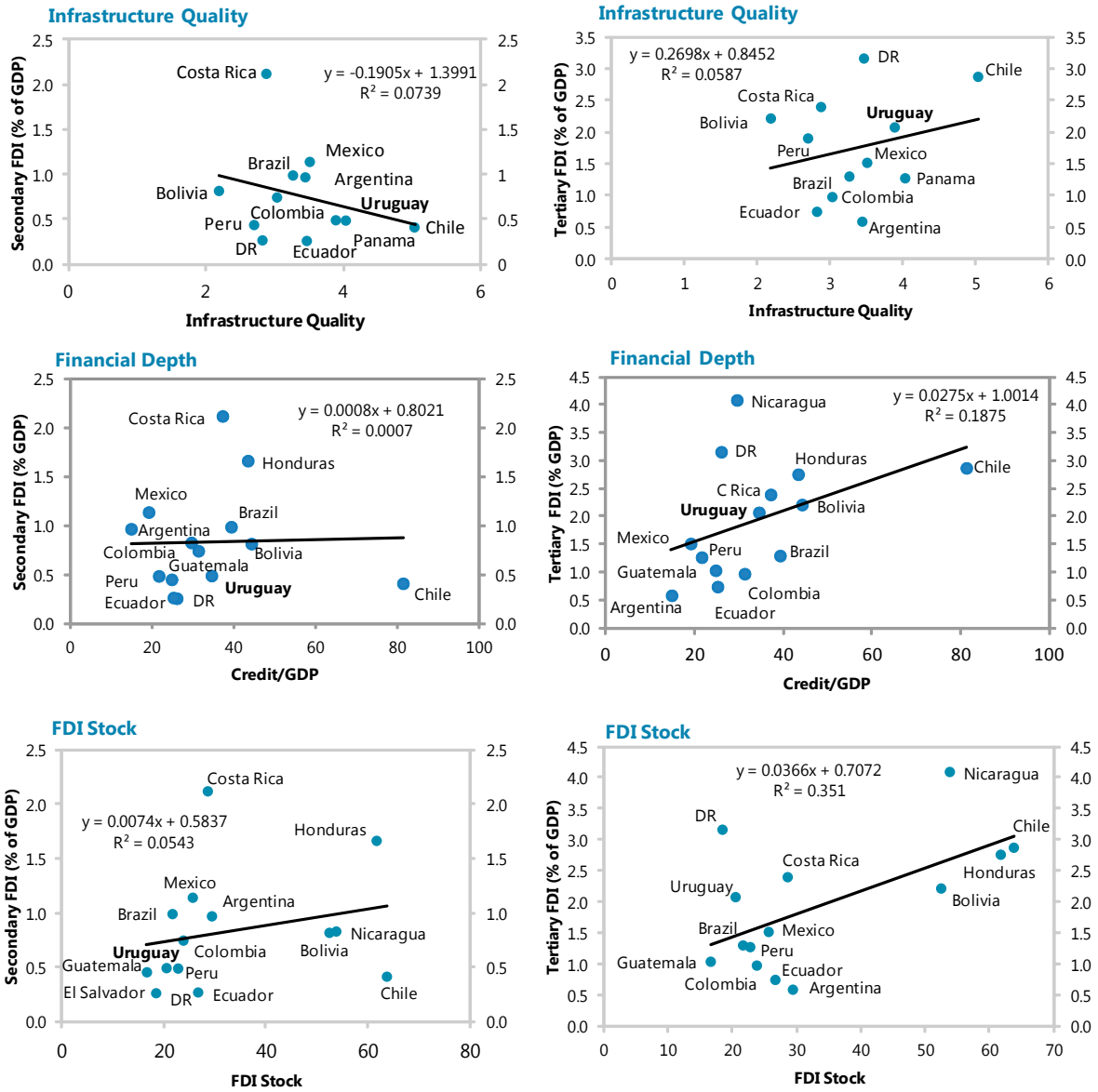
Sources: International Trade Centre, World Bank, Transparency International, World Economic Forum, Heritage Foundation, Fund staff calculations.

Figure 3a. Institutional/structural variables and FDI composition
(in percent of GDP, 2000-2010)

Judicial Independence

$y = 0.1072x + 0.4964$
$R^2 = 0.0489$

Judicial Independence

$y = 0.104x + 1.6038$
$R^2 = 0.0122$

Hiring Costs

$y = 0.0273x + 0.3988$
$R^2 = 0.135$

Hiring costs

$y = -0.0665x + 2.9787$
$R^2 = 0.2114$

Firing Costs

$y = -0.0042x + 1.0573$
$R^2 = 0.0608$

Firing Costs

$y = -0.0264x + 3.9428$
$R^2 = 0.2593$

Source: Global Competitiveness Report, World Economic Forum, fund staff Calculations.
For all variables, we use the average for the period 2000-2010, or for the data available in that period.

Figure 3b. Structural and Macroeconomic variables and FDI composition
(in percent of GDP, 2000-2010)

Infrastructure Quality

y = -0.1905x + 1.3991
R^2 = 0.0739

Infrastructure Quality

y = 0.2698x + 0.8452
R^2 = 0.0587

Financial Depth

y = 0.0008x + 0.8021
R^2 = 0.0007

Financial Depth

y = 0.0275x + 1.0014
R^2 = 0.1875

FDI Stock

y = 0.0074x + 0.5837
R^2 = 0.0543

FDI Stock

y = 0.0366x + 0.7072
R^2 = 0.351

Sources: Global Competitiveness Report, World Economic Forum. Fund Staff Calculations.
For all variables, we use the average for 2000-2010, or what is available.

Figure 4. Uruguay's relative ranking in selected Indicators

Note: The y-axis refers to indexes, taking values between 1 to 7. A higher position implies a better performance.
Sources: World Economic Forum, ECLAC. Fund staff calculations.