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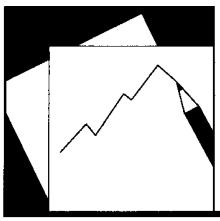

IMF Working Paper

Monetary Transmission in Dollarized and Non-Dollarized Economies: The Cases of Chile, New Zealand, Peru and Uruguay

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The Monetary Transmission in Dollarized and Non-Dollarized Economies: The Cases of Chile, New Zealand, Peru and Uruguay[1]

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Authorized for distribution by Ulric Erickson von Allmen

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Abstract

The paper conducts a comparative study of the monetary policy transmission in two economies that run a well-established IT regime, Chile and New Zealand, vis-à-vis two economies operating under relatively newer IT regimes, and which are exposed to a significant degree of dollarization, Peru and Uruguay. It is shown that the traditional interest rate channel is effective in Chile and New Zealand. For Peru and Uruguay, the exchange rate channel is instead more relevant in the transmission of monetary policy. This latter result follows from the limited impact of the policy rate in curbing inflationary pressures in these two countries, in combination with the fact that they have a relatively large and persistent exchange rate pass through. Finally, it is shown that the on-going de-dollarization process of Peru and Uruguay has somewhat strengthened their monetary transmission through the interest rate channel.

JEL Classification Numbers: E52; E58

Keywords: Monetary Policy Transmission; IT Regimes; Dollarization

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I. INTRODUCTION

The study of the monetary policy transmission mechanism in both advanced and developing countries has been the objective of numerous papers in recent years. In this literature, the transmission is broadly conceived as the analysis of how monetary policy decisions ultimately affect inflation, which is generally the primary objective of central banks. As many countries currently use the policy rate as their main monetary instrument, the empirical papers have specifically focused on studying how policy rate disturbances affect a particular subset of economic variables, notably inflation and output.

In an inflation targeting (IT) regime, the economic authorities conduct monetary policy as suggested above: the central bank usually sets a reference interest rate to achieve a pre-announced inflation target, while leaving other monetary aggregates and the exchange rate to be largely determined by market forces. In this environment, policy decisions are transmitted only with a delay to inflation as they first tend to affect different variables and only after that, through various channels, the inflation rate.[2]

The objective of this paper is to study the transmission of monetary policy empirically, comparing the cases of four small and open economies that operate under an IT regime and are exposed to different levels of dollarization. The aim here is to disentangle to what extent the degree of dollarization may help explain the differences in the monetary transmission in an IT regime. With this objective in mind, there are two countries examined that run well-established IT regimes and have a negligible exposure to dollarization problems: Chile and New Zealand. In addition, the cases of Peru and Uruguay are also studied, as these countries operate under relatively younger IT regimes and are exposed to a large degree of dollarization in their respective banking systems.[3]

In order to clarify the sequence through which policy decisions are transmitted to the rest of the economy, the analysis is divided in two stages. First, it is examined how the policy rate affects the key interest rates of each country, notably the money market rate, the deposit rate and the lending rate. Broadly speaking, the intention here is to evaluate the strength of what is in practice the first part of the transmission, which involves the pass through from the policy rate to the key interest rates of the economy. In the second stage, the paper uses a vector autoregressive (VAR) model to evaluate how changes in the money market rate affect

[2] See Mishkin (1996) for an in-depth discussion on the main channels of monetary policy transmission.

[3] Uruguay does not have yet a full-fledged IT regime, as the country only recently began transitioning towards this monetary arrangement. This transition took place in early 2005, when the country started to conduct monetary policy with the objective of meeting a pre-announced inflation target. In addition, after September 2007 Uruguay adopted the policy rate as the main instrument for monetary policy. Previously, monetary policy was essentially run by setting objectives on monetary aggregates to meet the inflation target.

output and inflation in these economies.[4] The aim is to assess empirically to what extent the strength and the channels of the transmission differ across countries. Finally, and to shed some light on the linkages between financial sector variables and the macroeconomy, the paper evaluates through different rolling VAR models whether the degree of credit in the economy and the level of dollarization may help explain the strength of the response of inflation to policy rate innovations in the different countries under study.

Turning to the main results, the paper finds that in Chile and New Zealand there is a significant pass through from the policy rate to the main interest rates of the economy. Accordingly, it is found that a contractionary monetary policy shock reduces inflation and output, suggesting the existence of a strong transmission of monetary policy through the traditional interest rate channel. For Peru and Uruguay the interest rate pass through is rather weak, and so is the overall transmission to output and inflation. For these two economies, however, evidence indicates that the exchange rate channel—rather than the interest rate channel—may play a more substantial role in curbing inflationary pressures, as indicated by the relatively larger exchange rate pass through of these two economies. Finally, the paper does not find concluding evidence regarding the role of credit in the transmission of monetary policy. However, it is found that as Peru and Uruguay reduced their levels of dollarization the effectiveness of the monetary policy transmission has somewhat increased in these countries.

The rest of the paper is organized as follows. Section II introduces a number of key stylized facts for these economies. Section III discusses the interest rate pass through from the policy rate to a subset of interest rates in each of these countries. Section IV analyzes the empirical analysis of the monetary policy transmission using a VAR model, while Section V deals with the role of financial variables in the transmission. Finally, Section VI presents some concluding remarks.

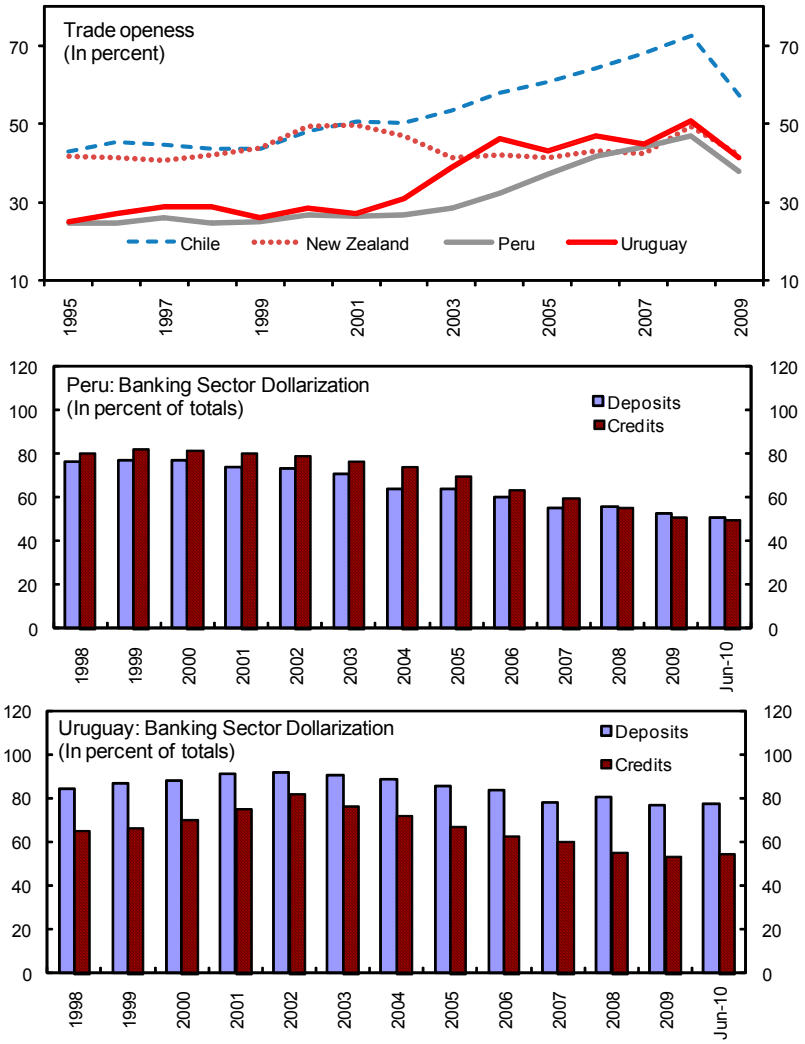
II. KEY STYLIZED FACTS

Chile, New Zealand, Peru and Uruguay are all small open economies that currently operate under IT regimes. All of them have relatively similar degrees of trade openness and are important commodity exporters. One key difference is, however, the degree of banking-sector dollarization. Whereas in Chile and New Zealand almost all credit and deposits are denominated in local currency, in Peru and Uruguay the share of foreign-currency denominated credits and deposits is large, though on a downward trend.[5]

[4] A significant number of papers study the monetary policy transmission in both advanced and emerging countries using VAR models as we do here (see Kim and Roubini, 2000; Peersman and Smets, 2001; and Leiderman et al, 2006).

[5] For an analysis on the recent de-dollarization trends in Peru and Uruguay see García-Escribano and Sosa (2011).

Figure 1. Selected Macroeconomic Indicators



Sources: countries' authorities and IMF staff calculations.

There are also additional differences regarding the performance of key fundamentals in these countries, as indicated in Table 1.[6] For instance, Uruguay and Peru had a relatively low variability of both the nominal exchange rate against the U.S. dollar (NER) and the real effective exchange rate (REER). This may reflect a 'fear of floating' type of behavior, which could owe to their significant degree of dollarization. In addition, Uruguay experienced a higher degree of output volatility relative to all other countries.[7] In the case of Peru, output

[6] For details on the variables used in Table 1 see Annex I.

[7] The 2010 Art IV Staff Report for Uruguay also discusses the fact that Uruguay's output volatility tends to be high relative to a number of selected peer countries.

volatility has been lower than in Uruguay, yet still above of that observed in Chile and New Zealand. Somewhat surprisingly, however, the volatility of CPI inflation has recently decreased in Uruguay, contrary to the other three economies where it has trended upwards.[8] Expected inflation has followed a similar pattern: in all countries but Uruguay its volatility increased over time. Interestingly, evidence indicates a relatively more active use of foreign exchange interventions in the three Latin-American countries in recent years. This contrasts with the case of New Zealand, where the volatility of reserves has decreased over time.

Table 1. Volatility of Selected Variables 1/

	REER		NER		Output		CPI inflation		Expected inflation (12-months ahead)		Foreign Reserves to GDP	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Chile	6.4	7.6	5.0	17.2	1.0	3.8	1.4	4.1	0.3	1.1	7.1	34.2
New Zealand	8.0	12.2	10.1	22.8	1.1	1.8	0.6	1.0	0.2	0.7	20.2	12.8
Peru	2.3	2.9	3.4	7.3	1.8	4.7	0.9	2.3	0.3	0.6	15.5	31.4
Uruguay	6.1	6.9	6.8	14.8	8.2	8.4	1.5	0.8	0.5	0.5	15.8	25.0

Source: Countries' authorities and IMF staff calculations.

1/ Standard deviations of y/y changes. For inflation-related variables, statistics are computed considering actual values of the variables.

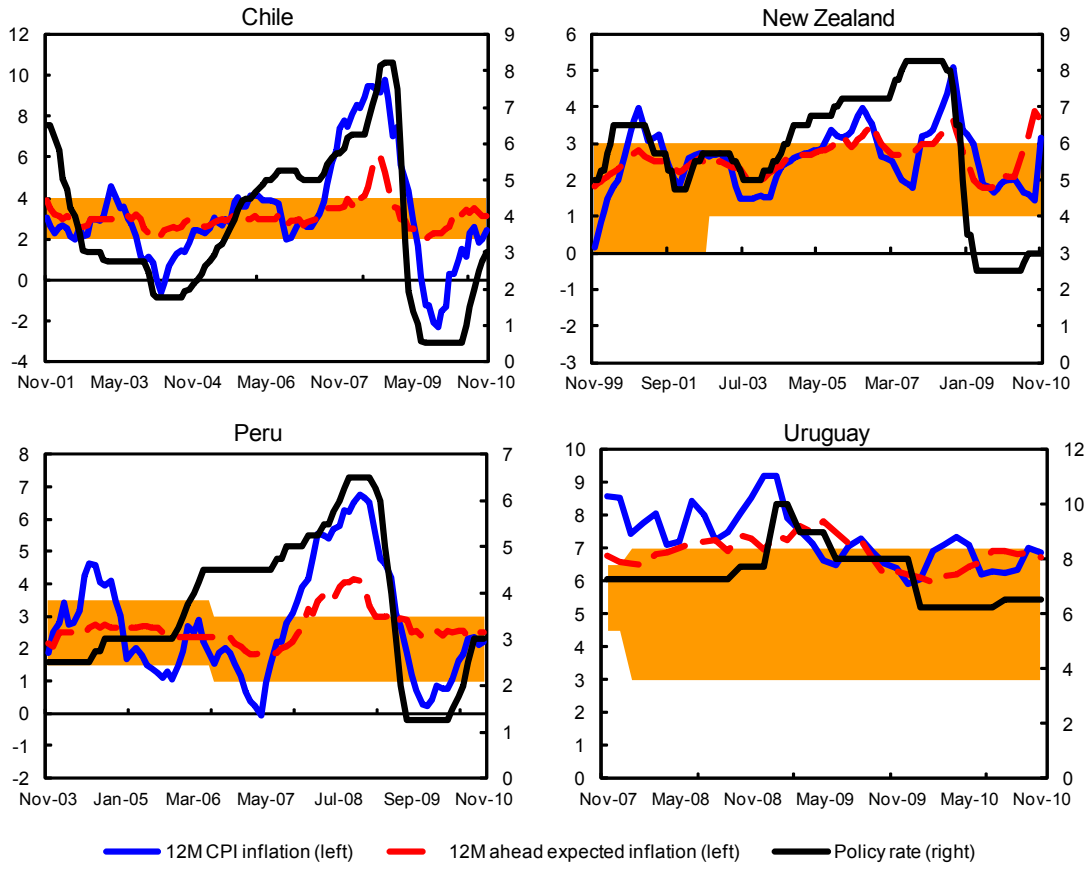
(1): January 2005 to December 2007.

(2): January 2008 to November 2010.

Although Uruguay's CPI inflation has been relatively more stable, it has also remained at a higher level relative to the other three countries, particularly during 2010 (Figure 2). A similar pattern arises when considering different measures of core inflation (not shown). Furthermore, actual and expected inflation have remained systematically in the upper band (or above) the target range in Uruguay, whereas in all the other cases both variables have hovered around their respective mid-point target ranges. As expected, inflation expectations have moved in tandem with actual inflation, yet showing a lower variability. In addition, in all four cases the policy rate has closely tracked the inflation rate, suggesting that monetary policy has been active in trying to curb inflationary pressures.

[8] This fact is partially explained by the evolution of certain prices in Uruguay that are somewhat controlled by economic authorities, notably transport prices and a number of selected utilities. These particularities have limited to some extent the variability of the inflation rate in the country.

Figure 2. Actual Inflation, Expected Inflation, Target Bands and Policy Rates



Sources: Contries' authorities and IMF staff calculations.

There are, however, particular differences in the evolution of the policy rate worth mentioning.[9] The sample considered here is divided in two periods: the first period starts with the introduction of the policy rate as the main monetary policy instrument for Peru in September 2003, going through August 2007; the second period starts with its introduction in Uruguay, in September 2007, going through the latest available observation (November 2010). Interestingly, Chile shows the most active use of monetary policy, measuring it by the number of policy rate ranges observed during these periods. This contrasts with the case of Uruguay, which had the fewest number of modifications, though the median change whenever there was a change in the policy rate was the largest. In addition, as Uruguay has had the highest average inflation rate, the policy rate has accordingly taken the highest value after its implementation. These results differ substantially from those of Peru, where

[9] Policy rates are taken from the website of each central bank, and reflect a target publicly announced by the central bank on the overnight interbank interest rate of each country.

evidence suggests a more active use of monetary policy and a lower change in the policy rate whenever it was modified. Overall, evidence points to the absence of a clear pattern in terms of the use of the policy rate across countries regardless of the level of dollarization and the date in which the IT regime was implemented.

Table 2. Inflation and Policy Rate
(In percent, unless otherwise specified)

	CPI inflation	Policy rate		Policy rate changes 1/			
	Avg	Avg level	Std deviation	No of times	Minimum	Maximum	Median
			2003M9-2007M8				
Chile	2.5	3.7	1.4	29	6	58	15
New Zealand	2.7	6.7	0.9	13	25	25	25
Peru	2.1	3.5	0.8	10	25	25	25
Uruguay	7.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
			2007M9-2010M11				
Chile	3.8	3.7	2.9	23	8	261	33
New Zealand	2.7	4.7	2.5	9	25	150	50
Peru	3.5	3.8	2.0	19	25	100	25
Uruguay	7.3	7.4	1.0	8	25	225	100

Source: countries' authorities and IMF staff calculations.

1/ Minimum, maximum, and median are based on the absolute value of the policy changes, in basis points.

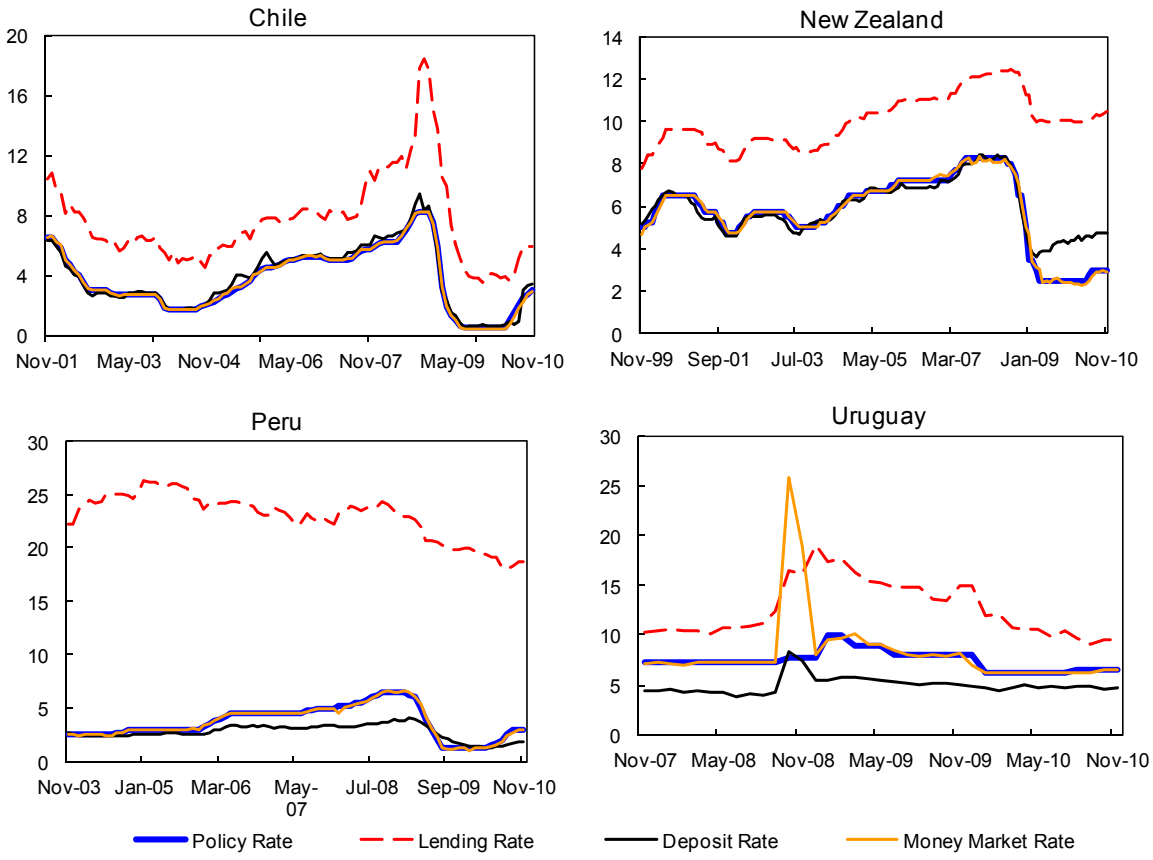
III. THE INTEREST RATE PASS THROUGH

In an IT regime, the transmission of monetary policy decisions initially takes place through the modification of the policy rate, which in turn affects interbank rates on impact. Changes in the latter are then transmitted to deposit and lending rates, thus affecting the consumption and saving decisions of individuals and firms, and hence aggregate demand and inflation. Simultaneously, the change in the policy rate may affect the overall availability of credit as well as different asset prices that react to short-run interest rates, thereby enhancing the transmission through the so-called credit and asset price channels. Additionally, as domestic and foreign interest rates may differ for comparable assets, arbitrage between them gives rise to nominal exchange rate fluctuations, which in turn affect inflation and economic activity through the so-called exchange rate channel.

As expected, Figure 3 shows that in all countries the policy rate and the money market (interbank) rate are almost completely overlapped. The only exception took place in Uruguay between October and November 2008, a period during which the central bank explicitly avoided large interventions in a disrupted interbank market as part of a strategy to deal with the global financial turmoil triggered by the collapse of Lehman Brothers. Besides this exception, it follows from this figure that the interest rate pass through from the policy rate to the interbank rate tends to be immediate and complete across countries.

It is also apparent from the figure that the co-movement between the policy rate and the deposit and lending rate is very strong in Chile and New Zealand. This relation is somewhat weaker in the cases of Peru and Uruguay, suggesting that the effectiveness of the policy rate in signaling the stance of monetary policy might not be that strong in these countries.

Figure 3. Local-Currency Deposit and Lending Rates, and Policy Rate



Source: Contries' authorities.

To evaluate formally the relationship between these key interest rates, the following simple OLS regression is conducted:

$$y_{it} = c_i + \alpha_i x_{it} + \varepsilon_{it}$$

where for any country i and period t, y_{it} is the change in either the deposit or the lending rate, c_i is a constant, x_{it} is the change in the money market rate and ε_{it} is a white noise component. The short-run effect of a money market rate change on the other interest rates is thus given by α_i. Tables 3 and 4 summarize the main results of the estimations.

Table 3. Pass-Through from the Money Market Rate to the Deposit Rate

	c	α	Short-run Pass-through	Cross-correlation	R-squared	Sample
Chile	0.00	0.78	0.78	0.87	0.76	1999M9–2010M11
t-Statistic	-0.08	20.72				
New Zealand	0.01	0.67	0.50	0.71	0.50	1999M4–2010M10
t-Statistic	0.70	11.68				
Peru	-0.01	0.32	0.32	0.75	0.57	2003M9–2010M10
t-Statistic	-1.49	10.54				
Uruguay	0.03	0.20	0.20	0.30	0.91	2007M9–2010M11
t-Statistic	0.71	19.91				

Source: IMF staff estimations.

Table 4. Pass-Through from the Money Market Rate to the Lending Rate

	c	α	Short-run Pass-through	Cross-correlation	R-squared	Sample
Chile	-0.01	0.67	0.67	0.72	0.51	1999M9–2010M11
t-Statistic	-0.21	11.88				
New Zealand	0.03	0.62	0.62	0.84	0.70	1999M4–2010M10
t-Statistic	3.18	17.94				
Peru	-0.03	0.19	0.19	0.13	0.02	2003M9–2010M10
t-Statistic	0.05	0.16				
Uruguay	0.03	0.10	0.10	0.32	0.10	2007M9–2010M10
t-Statistic	0.14	2.05				

Source: IMF staff estimations.

As visually suggested by Figure 3, the overall interest rate pass through in the cases of Chile and New Zealand is large. In these two countries the change in the policy rate has a sizable and significant effect on both the deposit and lending rates through changes in the interbank rate. In contrast, for Peru and Uruguay the policy rate pass through tends to be much weaker, yet suggesting a somewhat larger impact on the deposit rather than the lending rate.[10] The weaker relationship between these interest rates in the cases of Peru and Uruguay is likely to reflect differences in the structure, depth, and the degree of dollarization of their financial systems.

[10] These results should be treated with some caution since the sample period of the estimation in the case of Uruguay is particularly short. In any case, the results obtained here are broadly consistent with other studies that show a low pass through from the interbank rate to active and passive interest rates in the country.

IV. EMPIRICAL ANALYSIS OF THE TRANSMISSION OF MONETARY POLICY

After the initial transmission of the policy rate to the different interest rates of the economy, the monetary policy change is transmitted through the various channels discussed previously to the rest of the economy. This section specifically analyzes how this monetary innovation affects inflation and output in each country. In a nutshell, the effectiveness of monetary policy is assessed considering how inflation, the primary objective of the central bank, reacts to a policy driven increase in the money market rate (a contractionary monetary policy shock). Since the stance of aggregate demand also determines the evolution of inflation, the response of output to the same innovation is studied as well. With this objective in mind, the following vector autoregressive (VAR) model is estimated:

$$Y_t = A(L)Y_{t-1} + B(L)X_t + U_t \tag{1}$$

where *A(L)* and *B(L)* are a *n* x *n* and a *n* x *k* polynomial matrices in the lag operator *L*, respectively, Y_t is a *n* x *1* vector of endogenous variables, X_t is a *k* x *1* vector of exogenous variables, and U_t is a *n* x *1* vector of estimated residuals. X_t is included to control for those disturbances that are not directly managed by the monetary authority and may somewhat affect the dynamics of the model. The benchmark model takes the following form:

$$Y_t = \begin{bmatrix} R_t & IP_t & \pi_t - \pi_t^w \end{bmatrix} \tag{2}$$

where R_t is the money market rate, IP_t is the y-o-y change of an index of economic activity; and π_t-π_t^w is a measure of the y-o-y headline inflation that is effectively under the control of the monetary authority.[11] Intuitively, as these economies are small and open, world headline inflation will have a significant effect on their respective inflation rates. To effectively strip domestic inflation from external factors, the gap between domestic and external inflation is considered. This approach helps eliminate the so-called price puzzle problem often encountered in the empirical literature that studies the transmission of monetary policy (see Sims, 1992). The vector of exogenous variables is in turn given by

$$X_t = \begin{bmatrix} FF_t & WCPI_t & IP_t^{us} \end{bmatrix} \tag{3}$$

where FF_t is the U.S. Federal Funds rate; $WCPI_t$ is the y-o-y change of the world commodity price index, and IP_t^{us} is the U.S. industrial production index gap in logs. In terms of the identification, the model uses a standard Cholesky decomposition, with the variables ordered as in vector Y_t.[12] This implies, for instance, that R_t is contemporaneously affected only by its

[11] See Annex I for details on the different variables used in the VAR model.

[12] For robustness, estimations are compared with those obtained from a structural VAR model using an identification structure similar to that proposed in Kim and Roubini (2000), without showing major differences in results.

own shock, whereas π_t-π_t^w, being the most endogenous variable of the model, is affected on impact by all the structural innovations of the model.

The estimations consider monthly data, with the sample period tailored to each particular country. In the case of Chile, the sample starts with the introduction of the inflation targeting regime in September 1999, going through November 2010. For New Zealand, it goes from April 1999, when the so-called cash rate was set as the main policy instrument, until September 2010.[13] For Peru, the sample starts in September 2003, the month in which the full-fledged IT regime was implemented, going through November 2010. Finally, for Uruguay, even though the IT regime began to be implemented with the use of the policy rate as the main instrument only by September 2010, the sample considered here starts in January 2006 going through November 2010. This is done to have a larger sample to estimate the VAR model so as to obtain relatively more robust results. The model is estimated with two lags for all countries, as this was suggested by standard tests.

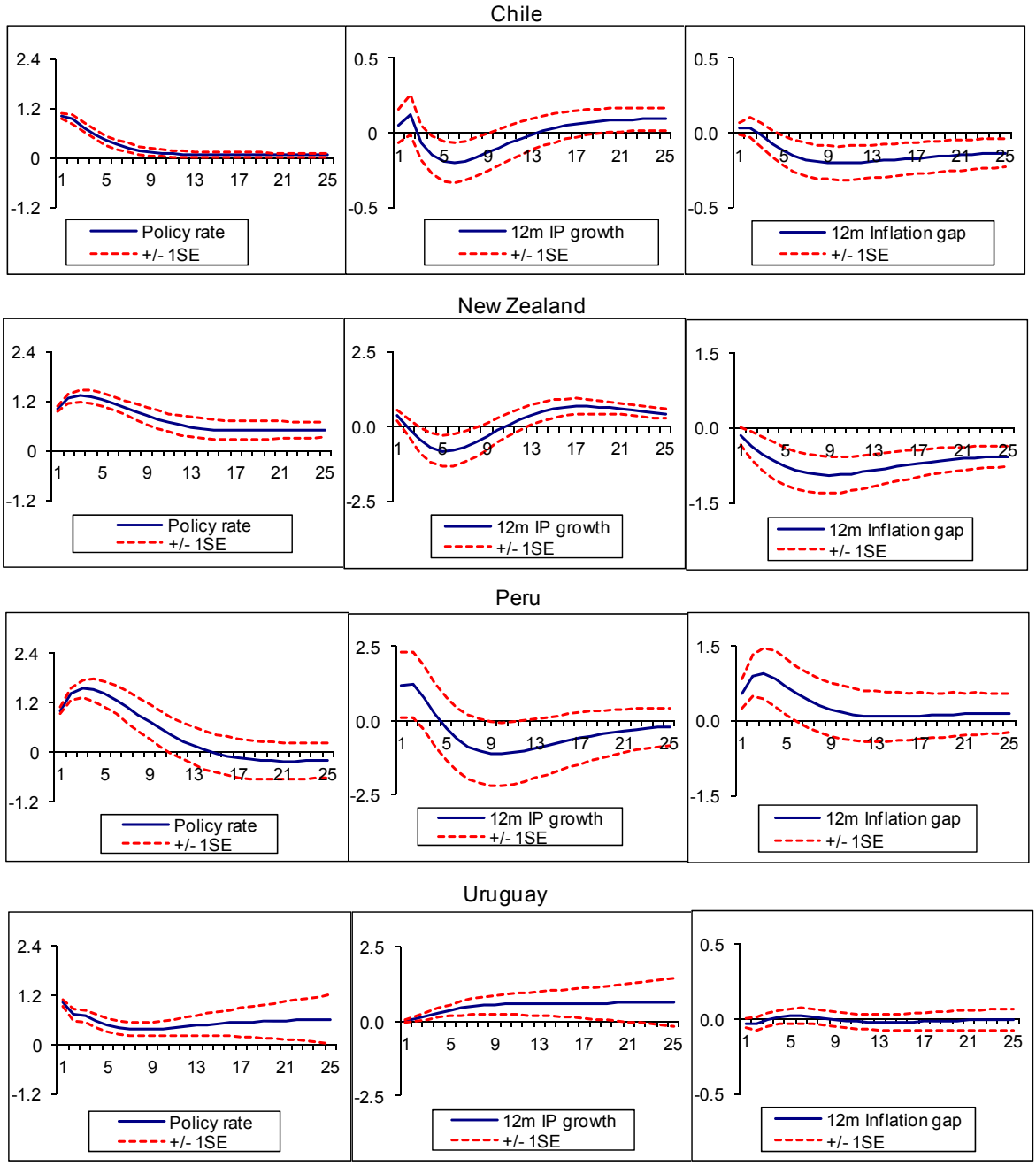
It follows from Figure 4 that the strength of the transmission of the interest rate change varies greatly across countries. The impulse-response (IR) functions to a 100 basis point increase in the money market rate—a contractionary monetary policy shock—are presented in this figure. In New Zealand, there is a significant and persistent contraction in the growth rate of output and inflation, in line with intuition. In Chile, the negative impact on output takes about three months to materialize, yet it tends to be persistent. In addition, the effect on inflation in this country is more immediate than that on output, and it also tends to be very persistent.

The two dollarized economies analyzed here appear to have distinct results. In Peru and Uruguay the interest rate hike leads to either a short-run increase in economic activity for about 5 months (Peru), or a slightly positive yet not very significant effect on it (Uruguay). In addition, the effect of the shock on inflation is either counter-intuitive (Peru) or rather insignificant (Uruguay). It is worth observing also that the absence of a contraction in economic activity after the rise in the interest rate may be related to the existence of balance sheet effects in these economies. That is, the associated exchange rate appreciation that follows the interest rate hike may lead to an improvement in the balance-sheets of those agents indebted in the foreign currency, generating an indirect positive effect on aggregate demand that may outweight the contractionary effect initially produced by the traditional interest rate channel.[14]

[13] In the case of New Zealand, information is mostly available on quarterly basis. Quarterly data have been converted to monthly data by taking a linear trend between each pair of consecutive quarters. At the time of running the estimations, quarterly data was available through 2010Q3.

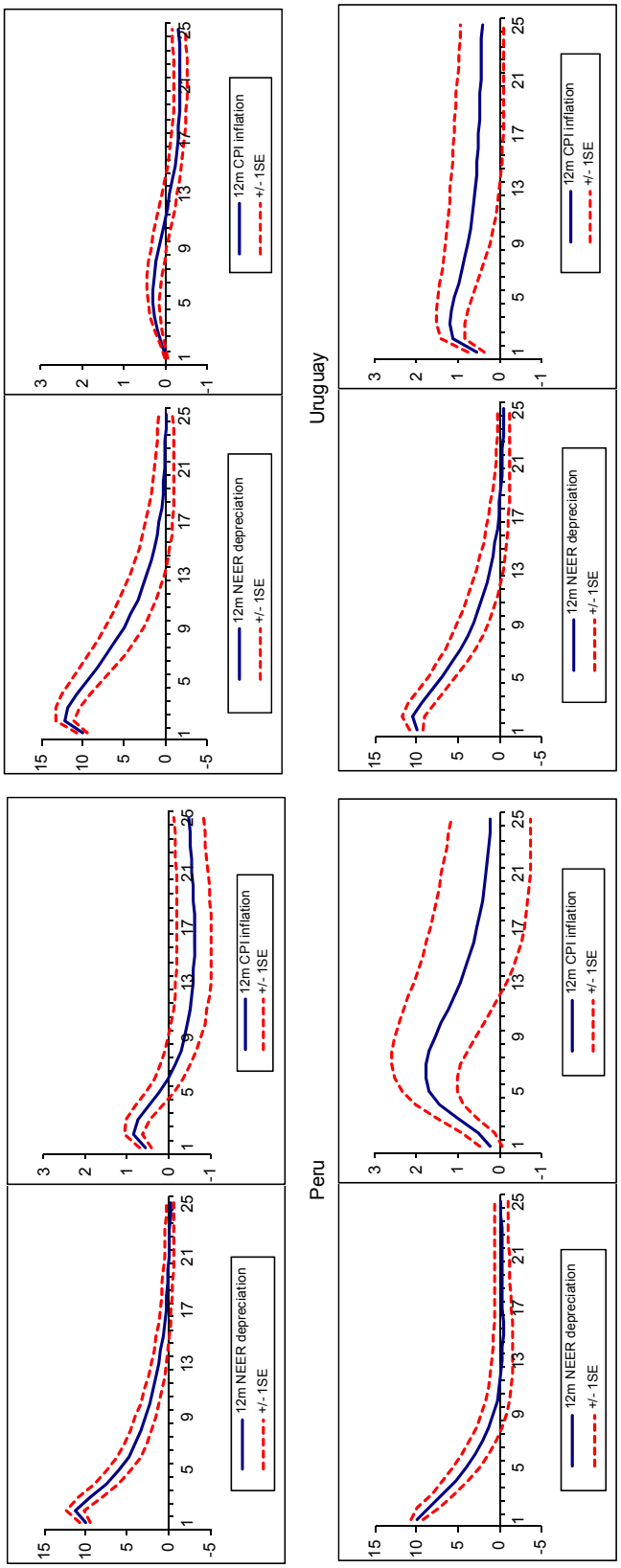
[14] Rossini and Vega (2006) point out that the presence of balance sheet effects may explain why economic activity seems to expand after an increase in the policy rate when considering Peruvian data.

Figure 4. Impulse Response Functions to a 100 Basis Points Increase in the Policy Rate
(In percent)



Source: IMF staff estimations.

Figure 5. Impulse Response Functions to a 10 Percent NEER Depreciation
(In percent)



Source: IMF staff estimations.

To analyze whether the exchange rate channel—rather than the interest rate channel—is relatively more relevant in Peru and Uruguay, a slightly different version of the VAR model is estimated. In this case, the vector of endogenous variables becomes

$$Y_t' = \begin{bmatrix} neer_t & IP_t & \pi_t & R_t \end{bmatrix} \tag{4}$$

where $neer_t$ indicates the y-o-y change in the NEER, IP_t is the y-o-y change of an index of economic activity, π_t represents the annual CPI inflation rate and R_t is still the money market rate. The rest of the model remains as in the baseline specification.

To explore the role of the exchange rate in the monetary transmission, the IR functions below evaluate how a NEER depreciation affects CPI inflation. As expected, Peru and Uruguay have the largest exchange rate pass through, likely reflecting their high degree of dollarization. In Peru, a 10 percent depreciation of the NEER raises CPI inflation up to 1.8 percent five months after the shock. This effect tends to also be very persistent. In the case of Uruguay, CPI inflation tends to increase more quickly, to about 1.2 percent after 3 months, and remains positive for a long period of time. These results contrast with those of Chile and New Zealand, where the NEER depreciation appears to have a small and short-lived effect on inflation.

V. The Role of Financial Factors in the Transmission of Monetary Policy

The overall strenght of the monetary transmission generally depends on numerous factors, with some of them being specific to each country. This section explores to what extent the characteristics of the domestic financial system, notably its depth and its degree of dollarization, may help explain the cross-country differences in the inflation response to the interest rate shock discussed previously.

Notice, first, that with a low degree of financial deepening the traditional interest rate channel may not be very operative, as a low development of domestic credit markets may impigne on the ability of the monetary authority to control the flow of credit and thereby the evolution of aggregate demand. In addition, if capital markets have only a modest relevance in the country, the strenght of the tranmission from asset prices to aggregate demand might be rather scant, thus limitting also the overall impact of the policy rate change on inflation. Furthermore, if the economy is also dollarized, the monetary transmission may turn to be even weaker as a consequence of the relatively lower influence of the monetary authority in modifying the key interest rates that affect consumption and investment decisions.

Table 5 presents a number of parameters for each country to evaluate the differences in the development of the financial system that currently exist among them. It follows from the table that Uruguay ranks very low in terms of credit to the private sector over GDP, a ratio that is closely followed by Peru. Particularly striking is the very small size of the stock market capitalization in Uruguay. Not surprisingly, Uruguay also has the largest share of

international debt issues over GDP, followed by Peru, reflecting the still limited scope for funding in local markets. This trend has recently started to revert, in line with the significant de-dollarization process experienced by these two economies. Overall, the evidence suggests that credit markets are somewhat more developed in Chile and New Zealand, a fact that may help explain the larger significance of the interest rate channel in these countries.

Table 5. Financial System Indicators

	Total Deposits 1/	Credit to Private Sector 1/	Stock Market Capitalization 2/	International Debt Issues 3/
	In percent of GDP 4/			
Chile	49.5	74.3	154.2	6.3
New Zealand	82.2	142.8	29.3	7.4
Peru	32.3	24.5	67.4	10.2
Uruguay	44.8	20.9	0.4	21.9

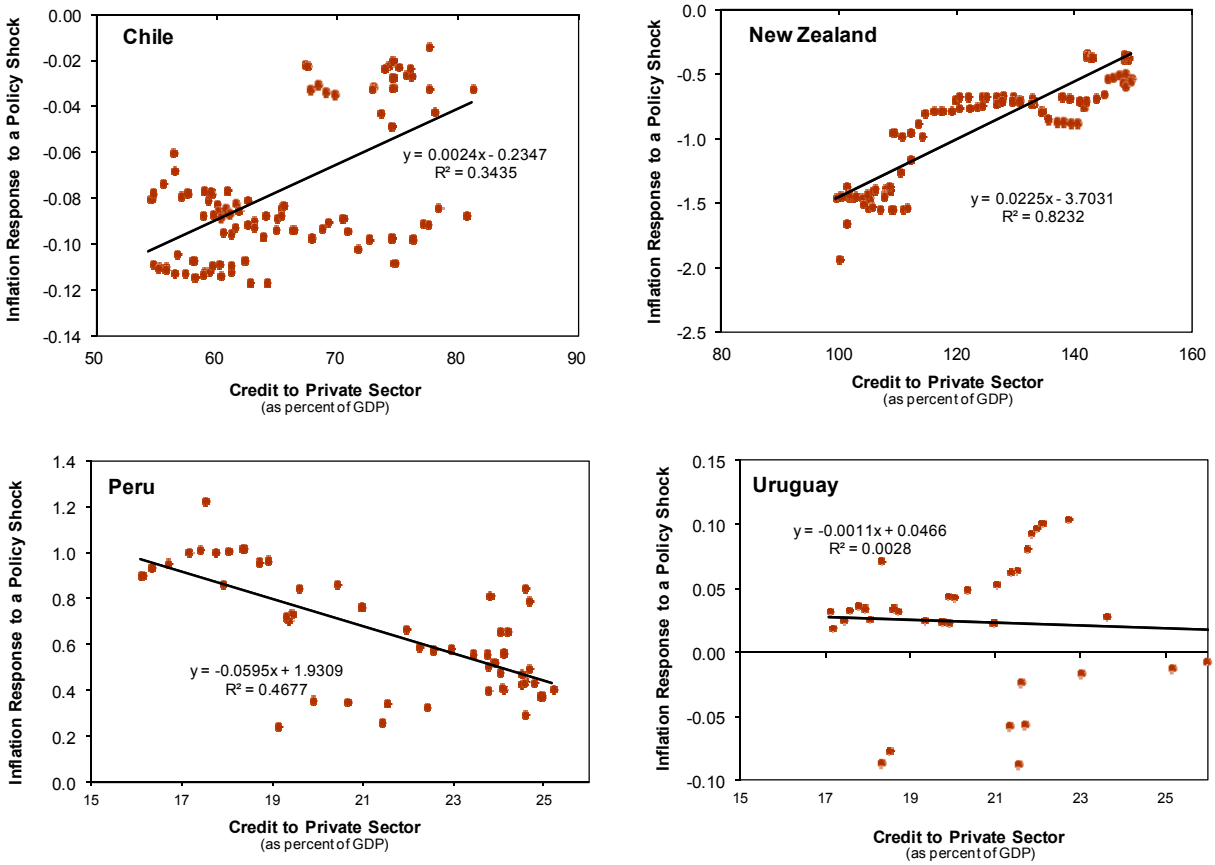
Source: countries' authorities, Federación Iberoamericana de Bolsas, New Zealand Exchange, BIS and IMF staff calculations
1/ As of November 2010.
2/ As of December 2010.
3/ International debt securities of all issuers (amortizations outstanding) from BIS Securities Statistics (Table 12A) as of Dec. 2010
4/ 2010 GDP taken from WEO forecasts.

To formally evaluate whether the development of domestic credit markets may affect the transmission of monetary policy, the paper undertakes a set of exercises considering again the benchmark VAR model. Specifically, the paper explores whether the three-month response of inflation to a 100 basis points increase in the money market rate changes as the credit-to-output ratio varies across countries. Regarding the econometric approach, the VAR model is estimated recursively. That is, for each country the first window of the sample period is set to three years (36 observations). The impulse response function to an interest rate shock is then calculated to pick the three-month response of inflation to the shock.[15] The process cointinues adding to the sample one aditional observation each time. The last (and largest) subsample for each country then coincides with that of the benchmark VAR model presented in the previous section. Once the three-month responses of inflation considering all the different subsamples are collected, a scatter plot is constructed including also the ratio of credit to the private sector over GDP for each country.[16]

[15] The three-month response of inflation was chosen to account for the delay between the period in which the policy rate is changed and its final effect on inflation.

[16] The credit-to-output ratio of each particular point in the scatter plot coincides with the stock of credit available at the end of the sample period of the associated rolling VAR.

Figure 6. Credit to the Private Sector and Inflation Response to a Policy Shock (100 basis points)
(Third-period Response, in percent)



Source: IMF staff estimations.

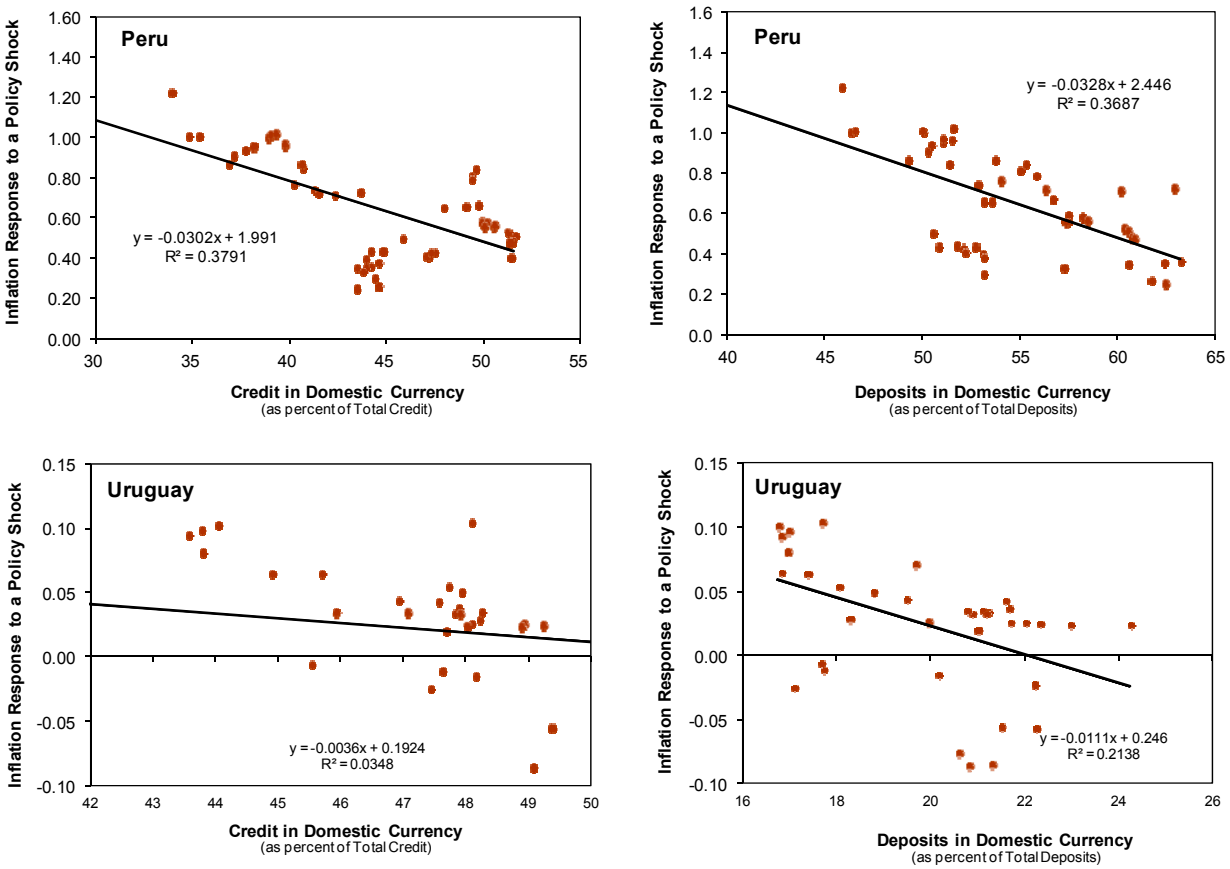
From Figure 6 follows that the credit-to-output ratio does not provide conclusive evidence regarding the role of credit in affecting the extent of the monetary policy transmission. Whereas the results for the case of Chile and New Zealand are counterintuitive, those of Peru and Uruguay suggest that the effectiveness of monetary policy in curbing inflationary pressures may have increased when more banking credit was available. In any case, the absence of a conclusive results is in line with the results of Saizar and Chalk (2008). These authors do not find clear-cut evidence showing a positive relation between the credit-to-GDP ratio and the strength of the transmission of interest rate shocks considering a set of developing countries.

A similar recursive VAR exercise is also conducted to assess whether the recent de-dollarization trend embarked by Peru and Uruguay has somewhat strengthened their monetary policy transmission. With this objective, the three-month response of inflation to the interest rate shock is again analyzed following the steps outlined before. Additionally,

two different measures of dollarization are used to construct the scatter plots used for each country: local currency credit to the private sector (as percent of the total credit) and local currency deposits (as percent of total deposits).[17]

Results suggest that the recent de-dollarization process of Peru and Uruguay is likely to have improved the effectiveness of monetary policy (Figure 7). Notewisthanding these results, for Uruguay the findings are still relatively weak, due to the relatively shorter sample used in this case. A relevant exercise left for further research is thus to evaluate whether the robustness of these findings rises as more data become available.

Figure 7. Credit and Deposits in Domestic Currency and Inflation Response to a Policy Shock (100 basis points)
(Third-period Response, in percent)



Source: IMF staff estimations.

[17] Due to data availability it was not possible to run the exercise considering only the deposits in local currency of the private sector for both Peru and Uruguay.

VI. Concluding Remarks

The paper found significant differences among Chile, New Zealand, Peru and Uruguay in terms of the transmission of monetary policy decisions. Whereas the traditional interest rate channel appears to operate to a large extent in Chile and New Zealand, evidence indicates that in Peru and Uruguay the exchange rate channel still plays a more substantial role in controlling inflationary pressures. This result follows from the still limited impact of the policy rate in controlling inflation in Peru and Uruguay, in combination with the fact that they both have a relatively large and persistent exchange rate pass through. The latter is in turn likely to be associated with the substantial dollarization of these economies. Importantly, however, as these two countries embarked on a substantial de-dollarization process, the relevance of the exchange rate channel is likely to decrease over time. Consequently, other channels of transmission may need to be further strengthened to curb inflationary pressures more effectively over the medium term.

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ANNEX 1.

Table A1. Data sources

Country	Variable	Description	Sample	Frequency	Source	Used in Section
Chile	CPI Inflation	Consumer Price Index	Jan-2005 to Nov-2010	Monthly	National Bureau of Statistics	II, III and IV
Chile	Credit to the Private Sector	Colocaciones domésticas en Pesos	Sep-1999 to Nov-2010	Monthly	Central Bank of Chile	V
Chile	Deposit Rate	Deposit Rate	Sep-1999 to Nov-2010	Monthly	International Financial Statistics, IMF	II and III
Chile	Expected Inflation	Inflation Expectations, 12-months ahead	Jan-2005 to Nov-2010	Monthly	Central Bank of Chile	II and III
Chile	Foreign Reserves	Reserve Assets	Jan-2005 to Nov-2010	Monthly	Central Bank of Chile	II
Chile	Lending Rate	Lending Rate	Sep-1999 to Nov-2010	Monthly	International Financial Statistics, IMF	II and III
Chile	Money Market Rate	Tasa de Interés Promedio Interbancaria a 1 día	Sep-1999 to Nov-2010	Monthly	Central Bank of Chile	II and III
Chile	NER	Nominal Exchange Rate, Local Currency per US$	Jan-2005 to Nov-2010	Monthly	Central Bank of Chile	II
Chile	Nominal GDP	Gross Domestic Product in local currency	1995-2010	Annual	Central Bank of Chile	II and V
Chile	Openess	Export plus Imports over GDP	1995-2009	Annual	Central Bank of Chile	II
Chile	Output	Monthly Indicator of Economic Activity, IMACEC	Jan-2005 to Nov-2010	Monthly	Central Bank of Chile	II
Chile	Policy Rate	Monetary Policy Rate	Sep-1999 to Nov-2010	Monthly	Central Bank of Chile	II and III
Chile	REER	Real Effective Exchange Rate, index 2005=100	Jan-2005 to Sep-2010	Monthly	International Financial Statistics, IMF	II
Chile	Target Bands	Inflation Target bands	Sep-1999 to Nov-2010	Monthly	Central Bank of Chile	II
New Zealand	CPI Inflation	Consumer Price Index	Jan-2005 to Nov-2010	Monthly	Reserve Bank of New Zealand	II, III and IV
New Zealand	Credit to the Private Sector	Claims on Private Sector	April-1999 to Nov-2010	Monthly	International Financial Statistics, IMF	V
New Zealand	Deposit Rate	Deposit Rate	April-1999 to Nov-2010	Monthly	International Financial Statistics, IMF	II and III
New Zealand	Expected Inflation	Inflation Expectations, 12-months ahead	Jan-2005 to Nov-2010	Monthly	Reserve Bank of New Zealand	II and III
New Zealand	Foreign Reserves	Total Reserves minus Gold	Jan-2005 to Nov-2010	Monthly	International Financial Statistics, IMF	II
New Zealand	Lending Rate	Base Lending Rate	April-1999 to Nov-2010	Monthly	International Financial Statistics, IMF	II and III
New Zealand	Money Market Rate	Money Market Rate	April-1999 to Nov-2010	Monthly	International Financial Statistics, IMF	II and III
New Zealand	NER	Nominal Exchange Rate, Local Currency per US$	Jan-2005 to Nov-2010	Monthly	International Financial Statistics, IMF	II
New Zealand	Nominal GDP	Gross Domestic Product in local currency	1995-2010	Annual	Statistics New Zealand	II and V
New Zealand	Openess	Export plus Imports over GDP	1995-2009	Annual	Statistics New Zealand	II
New Zealand	Output	Real Gross Domestic Product	Jan-2005 to Sept-2010	Quarterly converted to monthly data	Statistics New Zealand	II
New Zealand	Policy Rate	Monetary Policy Rate	April-1999 to Nov-2010	Monthly	Reserve Bank of New Zealand	II and III
New Zealand	REER	Real Effective Exchange Rate, index 2005=100	Jan-2005 to Sep-2010	Monthly	International Financial Statistics, IMF	II
New Zealand	Target Bands	Inflation Target bands	April-1999 to Nov-2010	Monthly	Reserve Bank of New Zealand	II
Peru	CPI Inflation	Consumer Price Index	Jan-2005 to Nov-2010	Monthly	National Bureau of Statistics	II, III and IV
Peru	Credit in Domestic Currency	Crédito SB al Sector Privado en Soles	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	V
Peru	Credit in Foreign Currency	Credit in Foreign Currency, end of period, stocks	1995-2009	Annual	Central Bank of Peru	II
Peru	Credit to the Private Sector	Crédito SB al Sector Privado	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	V
Peru	Deposit Rate	Tasa pasiva promedio en S/. (TIPMN)	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	II and III
Peru	Deposits in Domestic	Liquidez SB en MN (mill. S/.) minus Circulante SB (mill. S/.)	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	V
Peru	Deposits in Foreign Currency	Deposits in Foreign Currency, end of period, stocks	1995-2009	Annual	Central Bank of Peru	II
Peru	Expected Inflation	Inflation Expectations, 12-months ahead, using IMF staff calculations	Jan-2005 to Nov-2010	Monthly	Central Bank of Peru	II and III
Peru	Foreign Reserves	Net International Reserves	Jan-2005 to Nov-2010	Monthly	Central Bank of Peru	II
Peru	Lending Rate	Tasa activa promedio en S/. (TAMN), and Lending Rate	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru and IMF	II and III
Peru	Money Market Rate	Tasa interbancaria en Soles	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	II and III
Peru	NER	Nominal Exchange Rate, Local Currency per US$	Jan-2005 to Nov-2010	Monthly	Central Bank of Peru	II
Peru	Nominal GDP	Gross Domestic Product in local currency	1995-2010	Annual	Central Bank of Peru	II and V
Peru	Openess	Export plus Imports over GDP	1995-2009	Annual	Central Bank of Peru	II
Peru	Output	Gross Domestic Product Index	Jan-2005 to Nov-2010	Monthly	Central Bank of Peru	II
Peru	Policy Rate	Monetary Policy Rate	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	II and III
Peru	REER	Real Effective Exchange Rate, index 2005=100	Jan-2005 to Sep-2010	Monthly	International Financial Statistics, IMF	II
Peru	Target Bands	Inflation Target bands	Sep-2003 to Nov-2010	Monthly	Central Bank of Peru	II
Peru	Total Credit	Total Credit, end of period, stocks	1995-2009	Annual	Central Bank of Peru	II
Peru	Total Deposits	Total Deposits, end of period, stocks	1995-2009	Annual	Central Bank of Peru	II
Uruguay	CPI Inflation	Consumer Price Index	Jan-2005 to Nov-2010	Monthly	National Bureau of Statistics	II, III and IV
Uruguay	Credit in Domestic Currency	Credito al Sector Privado MN	Jan-2006 to Nov-2010	Monthly	Central Bank of Uruguay	V
Uruguay	Credit in Foreign Currency	Credit in Foreign Currency, end of period, stocks	1995-2009	Annual	Central Bank of Uruguay	II
Uruguay	Credit to the Private Sector	Credito al Sector Privado	Jan-2006 to Nov-2010	Monthly	Central Bank of Uruguay	V
Uruguay	Deposit Rate	Tasas de interés pasivas promedio	Sep-2007 to Nov-2010	Monthly	Central Bank of Uruguay	II and III
Uruguay	Deposits in Domestic	Deposits in Domestic currency	Jan-2006 to Nov-2010	Monthly	Central Bank of Uruguay	V
Uruguay	Deposits in Foreign Currency	Deposits in Foreign Currency, end of period, stocks	1995-2009	Annual	Central Bank of Uruguay	II
Uruguay	Expected Inflation	Inflation Expectations, 12-months ahead	Jan-2005 to Nov-2010	Monthly	Central Bank of Uruguay	II and III
Uruguay	Foreign Reserves	Reserve Assets	Jan-2005 to Nov-2010	Monthly	Central Bank of Uruguay	II
Uruguay	Lending Rate	Lending Rate - Ordinary	Sep-2007 to Nov-2010	Monthly	International Financial Statistics, IMF	II and III
Uruguay	Money Market Rate	Tasa Call - Bancos Privados Interbancaria	Sep-2007 to Nov-2010	Monthly	Central Bank of Uruguay	II and III
Uruguay	NER	Nominal Exchange Rate, Local Currency per US$	Jan-2005 to Nov-2010	Monthly	National Bureau of Statistics	II
Uruguay	Nominal GDP	Gross Domestic Product in local currency	1995-2010	Annual	Central Bank of Uruguay	II and V
Uruguay	Openess	Export plus Imports over GDP	1995-2009	Annual	Central Bank of Uruguay	II
Uruguay	Output	Indice de volumen fisico de la industria manufacturera (w/o refinery)	Jan-2006 to Nov-2010	Monthly	National Bureau of Statistics	II
Uruguay	Policy Rate	Monetary Policy Rate	Sep-2007 to Nov-2010	Monthly	Central Bank of Uruguay	II and III
Uruguay	REER	Real Effective Exchange Rate, index 2005=100	Jan-2005 to Sep-2010	Monthly	International Financial Statistics, IMF	II
Uruguay	Target Bands	Inflation Target bands	Sep-2007 to Nov-2010	Monthly	Central Bank of Uruguay	II
Uruguay	Total Credit	Total Credit, end of period, stocks	1995-2009	Annual	Central Bank of Uruguay	II
Uruguay	Total Deposits	Total Deposits, end of period, stocks	1995-2009	Annual	Central Bank of Uruguay	II