Capital flows, monetary policy and forex intervention in Peru

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Introduction

This article describes the main features of sterilised intervention in the foreign exchange market by the Central Reserve Bank of Peru (BCR), in the context of an economy with a financial system that operates with two currencies. The ability of local banks to extend credit in foreign currency complicates the normal transmission mechanisms of monetary policy because, on the one hand, the policy rate cannot affect those flows, and, on the other, a sharp depreciation can produce a credit contraction due to the deterioration of the quality of bank assets linked to balance sheet effects on the partially dollarised non-financial private sector portfolio of assets and liabilities.

As a result of the risks and vulnerabilities related to partial dollarisation, the BCR has adopted a policy framework that employs, in addition to the conventional policy rate, several instruments that can be classified as quantitative or unconventional. For example, higher reserve requirements on short-term foreign exchange liabilities are used to modulate this source of credit, but the BCR intervenes in the foreign exchange market, sterilising the excess liquidity with its own instruments that are restricted to local participants. Foreign exchange intervention is aimed at reducing the volatility of the exchange rate and accumulating international reserves, while avoiding signalling or committing to a particular level or tendency of the exchange rate.

This policy framework has allowed the BCR to prevent major disruptions due to the recent global financial crisis and to maintain the flow of credit during the turbulence. Additionally, the conventional transmission mechanism is in place with the interest rate as the instrument used to control inflation.

In this article we discuss four issues related to this policy framework. First, we examine the selection of a discretionary type of forex intervention vis-à-vis a rule-based one. Second, we review the issues related to sterilisation with respect to its cost, the instruments used and the degree of access by non-residents. Third, we consider the use of reserve requirements as a complement to the conventional policy rate tool. Finally, we assess the issue of competitiveness in an environment marked by strong capital flows.

Monetary policy under partial dollarisation

Persistent high inflation and severe macroeconomic imbalances in Peru during the 1970s and 1980s, along with a lack of inflation-adjusted instruments, led households to hold foreign currency as a store of value. This process of financial dollarisation increased significantly during the hyperinflation of 1988–90. In the years that followed, a wide-ranging package of reforms to the financial system and the conduct of monetary and fiscal policy was introduced to stabilise the economy. After achieving macroeconomic stabilisation during the 1990s, in 2002 the BCR implemented a fully fledged inflation targeting regime with an initial target of 2.5% and, since 2007, a continuous target of 2.0%, both with a tolerance range of ±1%. As a

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result, during the last decade the average annual inflation rate has been 2.3%. However, despite improved economic conditions and stable macroeconomic fundamentals during the last 20 years, inertia, transaction costs and a still underdeveloped capital market have led to a slow but continuous decline in the percentage of deposits and credits in US dollars, from a peak of 82% in 1999 to 44% in 2010 (Graph 1).

Graph 1

Peru: credit dollarization 1993 – 2010

As percentage of total credit
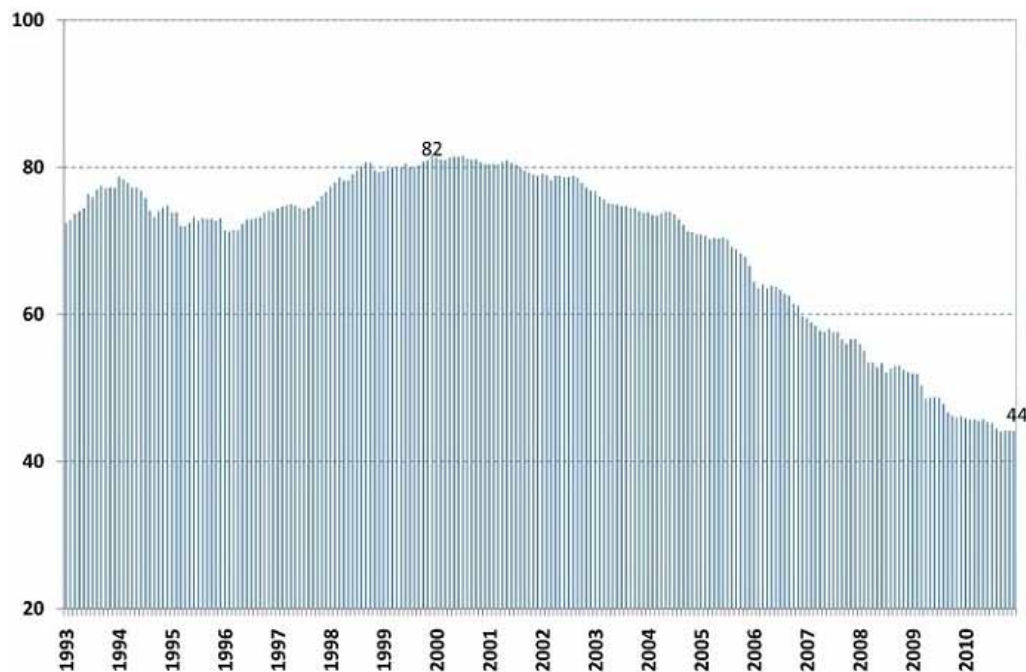
Dollarisation amplifies the reaction of financial intermediaries to sharp movements in their funding or high exchange rate volatility. As a result, the economy is prone to credit booms and busts associated with flows of foreign currency deposits, foreign credit lines or other capital flows; and to exchange rate movements that affect the quality of the credit portfolio. Dollarisation therefore alters the transmission mechanism of monetary policy and increases the liquidity and solvency risks of the financial system:

- The maturity mismatch generated in foreign currency introduces higher liquidity risks.

- Solvency risk increases when the assets of non-financial economic agents are mainly denominated in domestic currency while their liabilities are dollar-denominated.

After various external shocks, especially the 1998 Russian crisis, the BCR designed an action plan to prevent a credit contraction during episodes of financial stress. The monetary policy framework in Peru, in addition to the common features of an inflation targeting regime, began to include a set of measures to deal with the risks related to financial dollarisation. The strategy included three levels of liquidity: accumulation of international reserves by the BCR; high liquidity requirements of financial intermediaries; and a solid public sector financial position. In line with this strategy, international reserves increased from 12.9% of GDP in December 1994 to 28.8% in December 2010 (Graph 2).

Graph 2

Peru: net international reserves

In millions of US dollars and as percentage of GDP

Source: Central Reserve Bank of Peru.
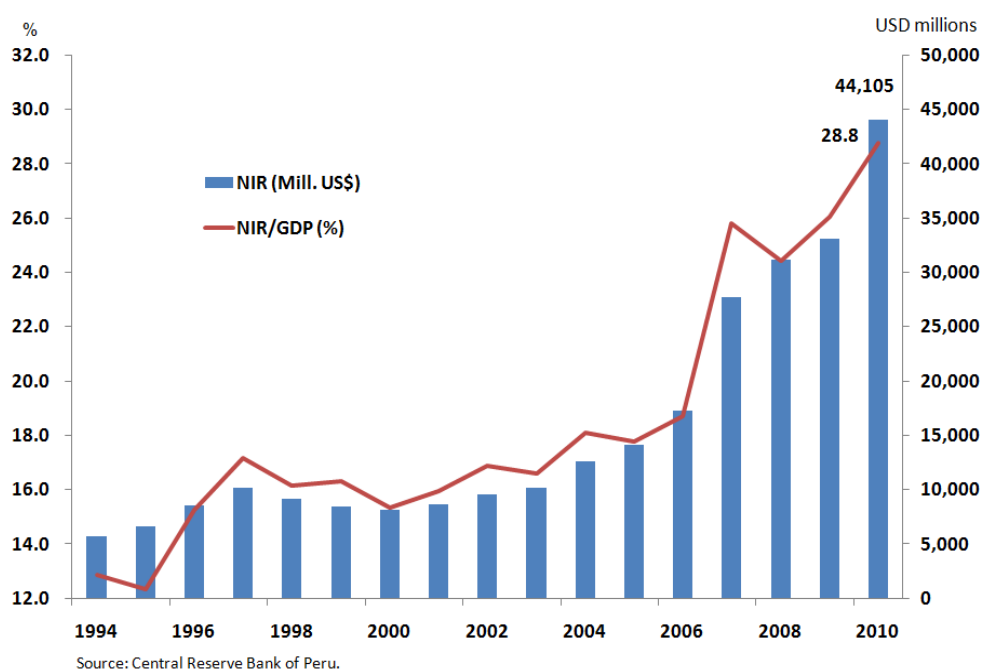
This set of monetary policy instruments can be divided into the normal price instrument of the interest rate and unconventional quantitative tools such as reserve requirements or the structure of the central bank balance sheet. The importance of the latter group of policies has gained attention due to central banks' innovative actions during the financial crisis, which aimed to prevent or limit a collapse of credit. The motivation for considering measures which act more directly on the flow of credit – rather than waiting for the more indirect impact of changes in interest rates – is that during credit booms or crunches, short-term interest rates become less effective at signalling the stance of monetary policy to financial intermediaries, which become insensitive to policy actions based on movements in the interest rate but more inclined to react to changes in expectations and risk appetite.

Quantitative instruments are part of a broader risk management approach of monetary policy that includes preventive and corrective measures intended to prevent a credit boom or crunch and to preserve financial stability and the transmission mechanisms of monetary policy. Graph 3 illustrates the common transmission mechanism of monetary policy, affecting inflation through changes in the short-term interest rate and the impact on the output gap, along with the effect of unconventional quantitative policies on banking credit and thus on the output gap and inflation rate.

Graph 3

Transmission mechanisms of monetary policy
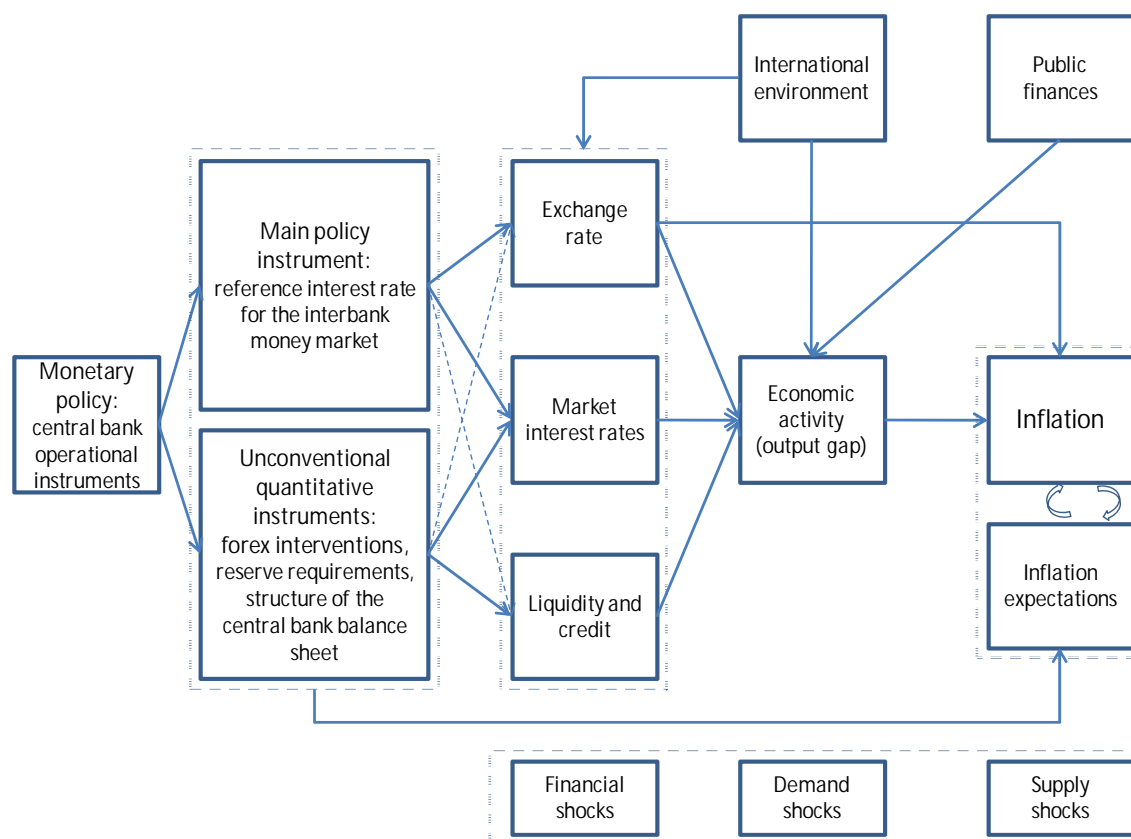
Forex intervention

The BCR's interventions in the forex market aim to reduce the volatility of the exchange rate without signalling or committing to a certain level of the rate. A predictable exchange rate would in practice represent a pegged exchange rate system, and would ensure the success of one-sided bets by speculators, thus making intervention fruitless. One way to prevent predictability and to reinforce the central bank's commitment to price stability is to use a rule-type intervention, based, for example, on announced amounts of purchases of foreign exchange in the market. However, it is possible for events to render intervention either unnecessary or insufficient, forcing the central bank to abandon or change the rule. Alternatively, a more discretionary type of intervention may be used in which the central bank has a clear idea that it is important to avoid signalling an exchange rate and is willing and able to engage in forex operations without an announced amount of operations.

Forex intervention occurs mainly through direct operations with commercial banks in the spot market and at the prevailing exchange rate. Additionally, when the forwards market in foreign currency is putting pressure on the exchange positions of local banks the BCR can conduct swaps through temporary purchases or sales of foreign currency, using an auction procedure. At maturity the swaps can be renewed or exercised, either of which has the same characteristics as an intervention in the market.

Graph 4 illustrates the timing and types of forex intervention by the BCR together with changes in the exchange rate since 2007. Three clear episodes can be identified: (i) before the Lehman Brothers collapse, (ii) after the collapse; and (iii) after the announcement of the

second round of quantitative easing by the Federal Reserve (QE2). The graph also identifies direct intervention in the foreign exchange spot market, and the placements or maturing swap operations. During these three stages, the central bank did not attempt to reverse the tendencies, but sought to reduce the degree of volatility. It can also be noted that the daily amount of interventions does not follow any rule.

Graph 4

Peru: exchange rate and central bank net forex intervention

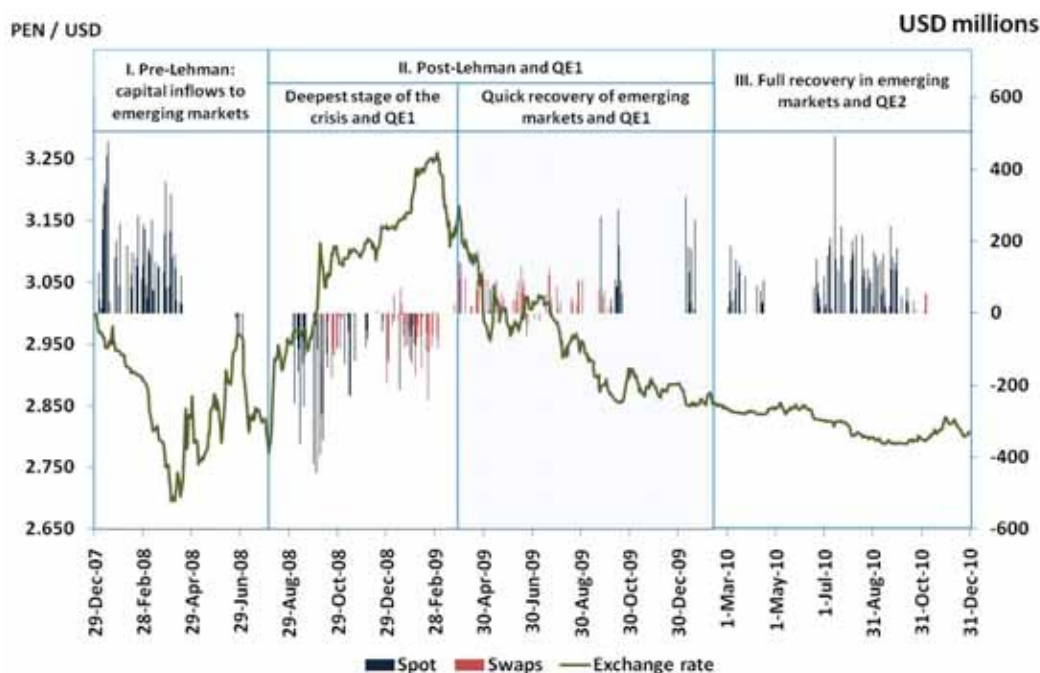In new soles per US dollar and millions of US dollars

Table 1 shows the three recent stages of surges and contractions of capital flows, how they materialised in the exchange markets and the amount of forex intervention by the BCR. There were $8.7 billion in purchases before Lehman and $6.5 billion (including $0.2 billion in swaps) at the time of the first signs of normalisation and the announcement and implementation of QE2. In contrast, during the period of acute crisis in the last quarter of 2009, the BCR sold $4.8 billion – $8.0 billion if we include the $3.2 billion in balances at maturity of swaps.

The BCR's forex intervention has been effective in reducing the volatility of the new sol. As Graph 5 shows, the Peruvian currency has been very stable in comparison with those of other countries in the region. The coefficient of variability has been close to 4%, whereas for other economies it has reached values between 8 and 13%.

Table 1

## Peru: spot and forward foreign exchange markets[1]

In millions of US dollars

	Pre-Lehman	Post-Lehman	
	Capital inflows to emerging markets	Deepest stage of the crisis and QE1	Full recovery in emerging markets and QE2
	Jan 2008– Apr 2008	Oct 2008– Mar 2009	Jun 2010– Dec 2010
Pension funds	−1,596	2,541	−768
Spot	−171	968	332
Forward	−1,425	1,573	−1,100
Non-resident investors	−1,013	1,944	−1,871
Spot	−2,388	1,604	−1,932
Forward	1,376	339	61
Other residents	−6,119	3,499	−3,830
Private, non financial	−6,119	2,489	−4,450
Financial institutions	−1	1,010	619
Central bank interventions	8728	−7,984	6,469

[1] Positive figures imply net demand and negative figures net supply, positions.

Graph 5

Nominal exchange rate

Variability coefficient, SD/average
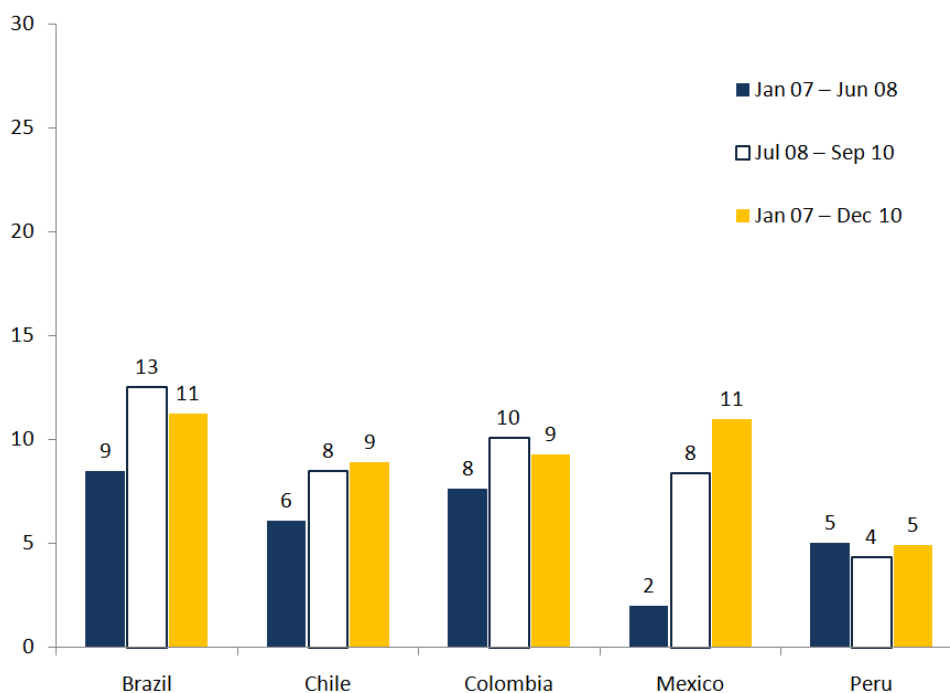
Sterilisation

To avoid side effects of forex intervention on the ability to control inflation, the central bank needs sufficient capacity for sterilisation. Two crucial factors helped to accomplish this goal in Peru: a solid fiscal position and the increasing demand for monetary base. In Table 2, a simplified BCR balance sheet is presented in terms of percentages of GDP; note that fiscal deposits represent 10% of GDP, which is about 35% of the size of international reserves. The fiscal contribution to sterilise the liquidity created by foreign exchange intervention also helps to reduce pressure on the real exchange rate.

Table 2

Balance sheet of the Central Reserve Bank of Peru

As percentage of GDP

Assets		**Liabilities**	
Net international reserves	28.8%	Treasury deposits	10.3%
		Central bank securities	1.8%
		Term deposits of banks	4.2%
		Reserve requirements	6.1%
		Other liabilities	1.0%
		Currency (notes and coins)	5.4%

Sterilised interventions should not affect the ability to use the short-term interest rate as a policy tool. To assess the impact of forex intervention on the variability of the interest rate, we calculated the ratio of the volatility of the interbank interest rate to the variability of the exchange rate in selected economies with a floating exchange rate. Graph 6 shows that Peru has the lowest ratio.

Graph 6

Interest rate volatility

Relative to exchange rate volatility
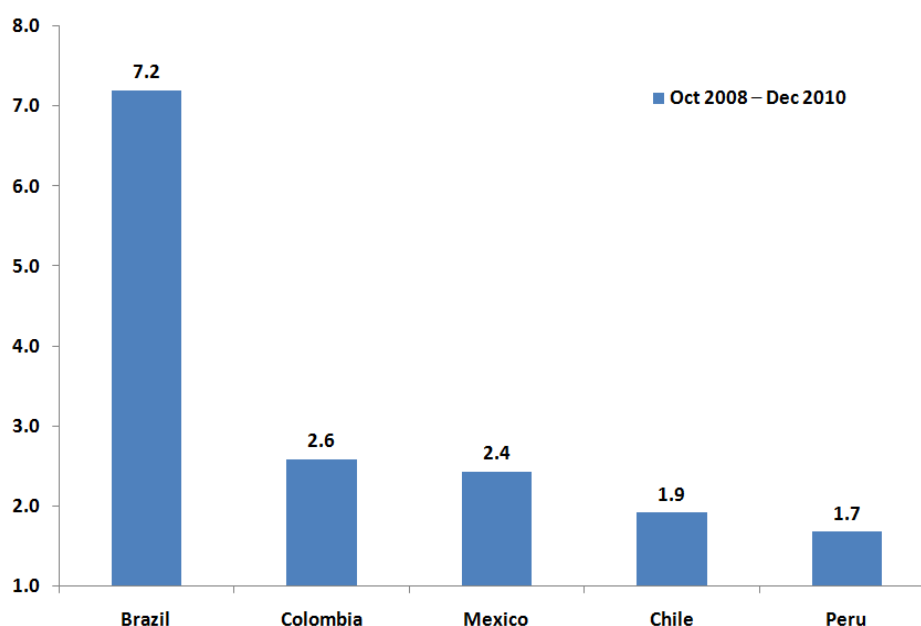
Another concern related to sterilisation is the financial cost from the carry cost or interest rate differential between the returns on international reserves and the interest paid on the liabilities of the central bank. When local interest rates are higher, the central bank could face losses. One component that eases this burden is the currency, which is an interest-free liability. As shown in Graph 7, the return on foreign assets held by the BCR exceeds the average cost of its liabilities.[2]

Graph 7

Central bank NIR yields and cost of funds

	Yield	Cost of funds	Net yield
2007	4.81%	3.34%	1.47%
2008	4.06%	3.68%	0.38%
2009	4.02%	2.17%	1.85%
2010	1.89%	0.72%	1.16%
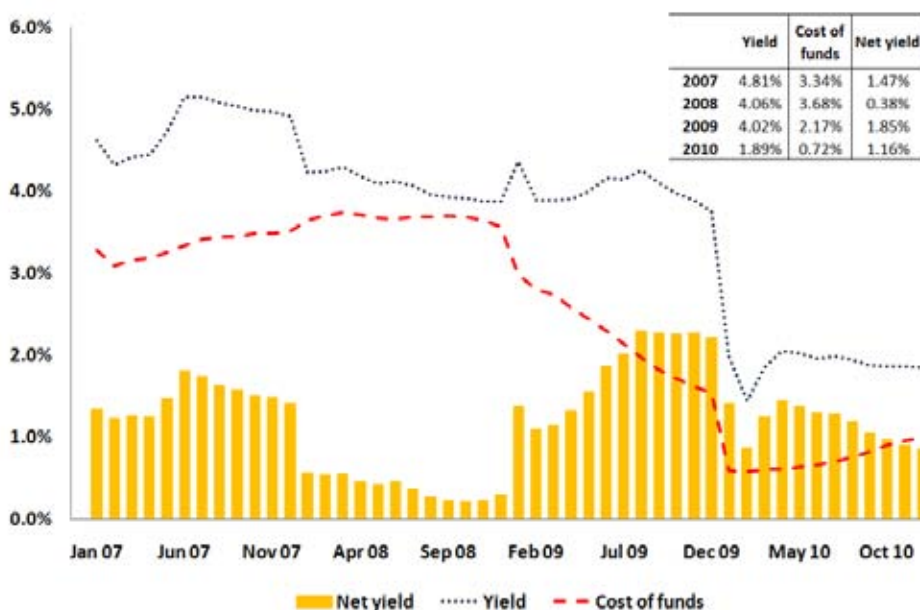
Finally, sterilised interventions can create an incentive for additional capital inflows due to the differential between the local and international interest rates. This could neutralise monetary policy, either by paralysing the use of the policy rate or by attracting further foreign financing. These capital flows have as an additional incentive the expectation of appreciation of the local currency.

The recent surges in capital inflows in Peru before the Lehman collapse and with QE2 were reflected in the growth in demand by non-residents for different financial instruments in local currency, including the sterilisation paper of the central bank. To avoid the circularity of sterilised intervention attracting more capital inflows, the central bank: (i) imposed a 4% fee on purchases or sales of BCR paper to participants other than local financial institutions, in order to limit resale to non-residents; (ii) increased to 120% the reserve requirement on local currency deposits for non-residents; and (iii) substituted certificates of term deposits as sterilisation instruments to prevent the resale of other instruments in local currency to non-residents and their subsequent replacement by BCR paper.

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[2] There is no consensus about the accounting treatment of exchange rate losses generated by a currency appreciation on international reserves valued in local currency. Some central banks register them in the profit and loss report, and others as a separate item in the capital account. From an economic point of view, the change of valuation in local currency of international reserves is not relevant, as it would be meaningless to register and distribute dividends from a currency depreciation that increases the nominal amount of international reserves.

In addition, the Superintendency of Banks (SBS) and the Treasury have put macroprudential measures in place. The SBS cut the limit on long net foreign positions of banks from 75% to 60%, limited the amount of daily and weekly forex operations by pension funds, and recently pre-published a regulation limiting banks' long position in derivatives to 40% of their net worth.

On the other hand, the Treasury has taxed the capital gains generated by forward contracts at a rate of 30%, and recently issued on the international market bonds denominated in domestic currency but paid in foreign currency, an operation that increased demand for foreign currency by domestic agents that purchased those bonds. In 2010, the BCR increased the limit on pension funds' foreign investment from 17% to 30%.

Reserve requirements

The accumulation of foreign currency liquidity by financial intermediaries has been determined mainly by macroprudential policies. In particular, the BCR uses reserve requirements to manage capital flows and at the same time accumulate a buffer stock of international reserves. For instance, during the capital inflow episode in the first quarter of 2008, the central bank raised domestic and foreign currency reserve requirements and implemented a series of other measures aimed at discouraging holdings of central bank instruments by non-resident investors. The rate of marginal domestic currency reserve requirements was raised from 6.0% to 25.0% (Table 3), reserve requirements for deposits of non-residents were increased to 120% and marginal reserve requirements in foreign currency were raised from 30% to 49%.[3]

Also, due to the quantitative easing in the developed world, there was a resurgence of capital inflows during the second part of 2010. In this case, the BCR again raised reserve requirements, to 25% in domestic currency, 55% in foreign currency and 75% for the external short-term liabilities of the financial system. The central bank also reinstated the reserve requirement ratio for domestic currency deposits of non-residents, setting it at 120%. In addition, observing an increase in lending to the domestic market from domestic bank subsidiaries abroad, the BCR included their liabilities within the total liabilities subject to reserve requirements.[4]

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[3]   During the intensification of the global financial crisis in the fourth quarter of 2008, the reserve requirements were reduced in order to prevent a credit contraction.

[4]   In September 2007, the central bank eliminated the reserve requirements for external loans of commercial banks with maturities of two years or more in order to extend their maturities. The longer-term external funding of banks increased from 17% of total external funding in October to 50% in December 2007.

Table 3

Monetary policy interest rate and reserve requirements ratios, 2006–11

Monetary policy interest rate: reference rate for the interbank money market	Reserve requirements ratios							
	Legal minimum required ratio	Domestic currency			Foreign currency			
					General regime		External liabilities	
		Marginal requirement for deposits	Policy increases in the average ratio	Required ratio for non-residents	Marginal requirement for deposits	Policy increases in the average ratio	Short-term	Long-term
I. Pre-Lehman: capital inflows and inflationary pressures in emerging markets								
May 06 4.50%	6.0%				30%		30%	30%
Jul 07 4.75%	6.0%				30%		30%	30%
Sep 07 5.00%	6.0%				30%		30%	0%
Jan 08 5.25%	6.0%				30%		30%	0%
Mar 08 5.25%	8.0%	15.0%		15.0%	40%		40%	0%
Apr 08 5.50%	9.0%	20.0%		40.0%	45%		45%	0%
Jun 08 5.75%	9.0%	20.0%		40.0%	45%		45%	0%
Jul 08 6.00%	9.0%	25.0%		120.0%	49%		49%	9%
Aug 08 6.25%	9.0%	25.0%		120.0%	49%		49%	9%
Sep 08 6.50%	9.0%	25.0%		120.0%	49%		49%	9%
II. Post-Lehman and QE1								
Post-Lehman: deepest stage of the crisis and QE1								
Oct 08 6.50%	9.0%			120%	35%		0%	0%
Dec 08 6.50%	7.5%			35%	30%		0%	0%
Feb 09 6.25%	7.5%			35%	30%		0%	0%
Mar 09 6.00%	6.0%			35%	30%		0%	0%
Post-Lehman: quick recovery of emerging markets and QE1								
Apr 09 5.00%	6.0%			35%	30%		0%	0%
May 09 4.00%	6.0%			35%	30%		0%	0%
Jun 09 3.00%	6.0%			35%	30%		0%	0%
Jul 09 2.00%	6.0%			35%	30%		0%	0%
Aug 09 1.25%	6.0%			35%	30%		0%	0%
Dec 09 1.25%	6.0%			35%	30%		0%	0%
Feb 10 1.25%	6.0%			35%	30%		35%	0%
III. Post-Lehman: full recovery in emerging markets and QE2								
May 10 1.50%	6.0%			35%	30%		35%	0%
Jun 10 1.75%	6.0%			35%	30%		35%	0%
Jul 10 2.00%	7.0%			40%	35%		40%	0%
Aug 10 2.50%	8.0%	12%		50%	45%	0.10%	50%	0%
Sep 10 3.00%	8.5%	15%		120%	50%	0.20%	65%	0%
Oct 10 3.00%	9.0%	25%		120%	55%	0.20%	75%	0%
Nov 10 3.00%	9.0%	25%		120%	55%		75%	0%
Dec 10 3.00%	9.0%	25%		120%	55%		75%	0%

Rossini and Quispe (2010) describe the 1999–2001 credit crunch in Peru as being caused by the combination of an initial surge in capital inflows and a subsequent expansion of banking credit, followed by a sharp contraction of credit due to a sudden stop of capital flows in conjunction with a sharp currency depreciation stemming from the 1998 Russian crisis. Graph 8 shows banking credit as a proportion of GDP, including a band of ±2% constructed around a series smoothed with a Hodrick-Prescott filter, which can be used to identify periods of excessive credit expansion or contraction. Since the recovery from the financial crisis, credit has remained inside this band.

Graph 8

Peru: credit–GDP ratio 1993 – 2010

Annual ratios from quarterly data, in percentages
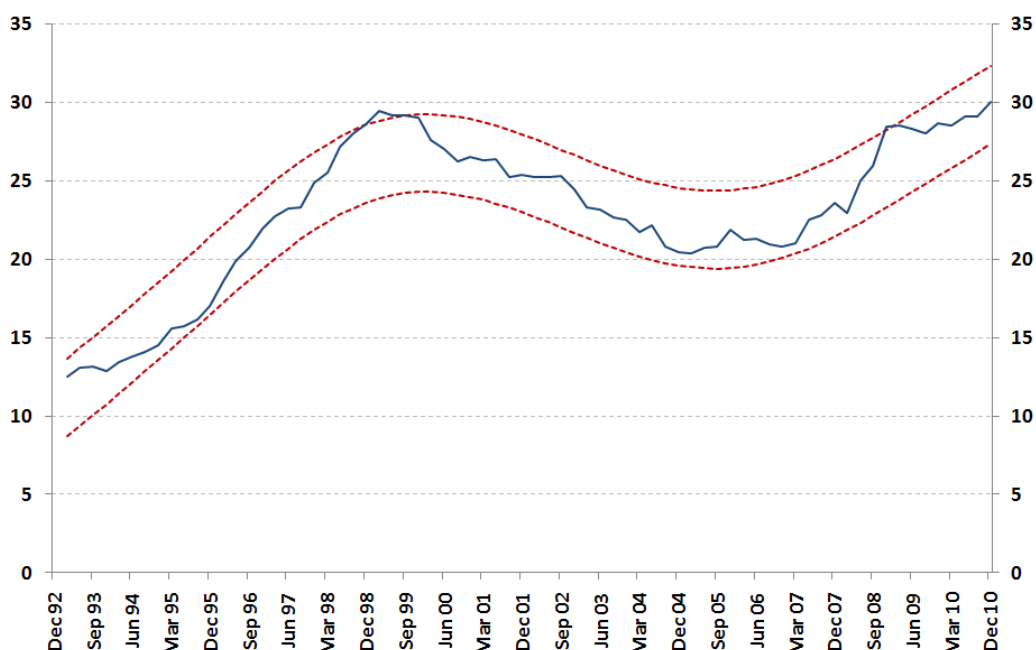
Real exchange rates

The nominal appreciation of the exchange rate caused by capital inflows raised concerns about the negative effect of this situation on tradable sectors. To assess this impact, we review real exchange rate data and evaluate the deviations from the equilibrium real exchange rate. In both instances, it is clear that the surge in capital inflows has not had a major negative effect on competitiveness in the case of Peru.

In Graph 9, we present the real effective exchange rate (REER) index and observe that it has been within ±5% of the average level for 1993–2010. This relative stability of the real exchange rate can be confirmed in international comparisons. Table 4 shows the comparative coefficient of variability for 22 countries; the REER of the new sol is the third least volatile for the period December 1994–December 2010, and the least volatile for the shorter period of January 2001–December 2010.

Graph 9

Real effective exchange rate

Index based on 1993–2010 average = 100

Table 4

Coefficient of variability of the real effective exchange rate[1]

Country	Dec 1994–Dec 2010	Jan 2001–Dec 2010	Country	Dec 1994–Dec 2010	Jan 2001–Dec 2010
Brazil	21.3%	22.7%	United States	8.0%	7.8%
Czech Republic	20.9%	11.5%	Israel	9.2%	6.3%
South Africa	14.1%	12.2%	Thailand	10.2%	7.0%
Korea	11.9%	11.9%	Euro area	7.3%	5.3%
Indonesia	19.1%	7.8%	Chile	7.7%	6.9%
Philippines	11.6%	11.3%	Sweden	7.7%	5.4%
Australia	12.3%	10.5%	India	4.6%	4.5%
Canada	10.8%	9.9%	Malaysia	9.5%	3.7%
Japan	13.9%	9.0%	Switzerland	4.9%	4.0%
United Kingdom	9.3%	9.7%	Singapore	5.4%	3.7%
Mexico	12.7%	8.4%	**Peru**	**5.1%**	**3.6%**

[1] Calculations based on the BIS effective exchange rate indices.

Source: Bank for International Settlements.

We use the behavioural equilibrium exchange rate (BEER) method to estimate the equilibrium real exchange rate. Table 5 shows the estimated elasticities of the REER from its fundamental determinants.[5] According to the estimations, this approach shows no major misalignments of the REER with respect to its equilibrium path (Graph 10).

Table 5

Empirical results

Fundamental variable	Elasticity
Net foreign liabilities / GDP	0.20
Terms of trade	−0.24
Trade liberalisation (exports and imports) / GDP	0.14
Peruvian GDP / GDP of Peru's trade partners	−0.30
Public expenditure / GDP	−0.01
Credit dollarisation ratio	0.08

Graph 10

Peru: behavioural equilibrium exchange rate

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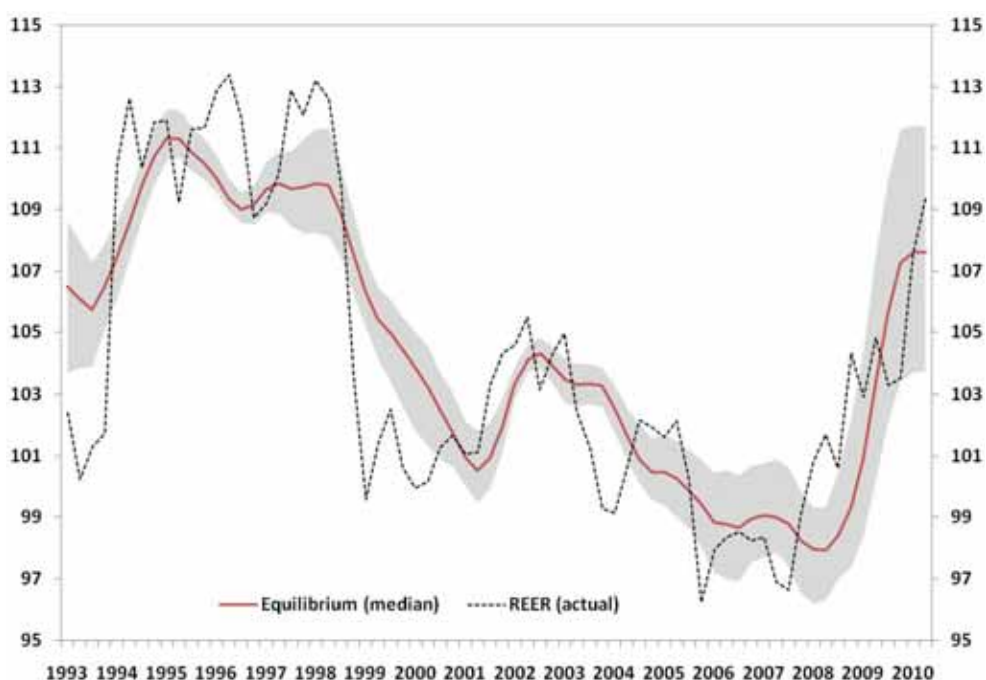
5   The calculations are based on Rodríguez and Winkelried (2011).

Concluding remarks

The Central Reserve Bank of Peru has developed a policy framework based on a risk management approach. The vulnerabilities associated with the partial dollarisation of the banking system have been taken into account in order to incorporate unconventional policy tools like intervention in the foreign exchange market, the accumulation of international reserves, the application of different forms of reserve requirements and various types of liquidity sterilisation. With this policy framework, the Peruvian economy was relatively isolated from the effects of the global financial crisis and was able to return to growth with low inflation and to avoid major disruptions due to the surge in capital inflows.

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