

# Forex interventions in Peru: 2002-2004

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## Introduction

Financial dollarisation is a key characteristic to consider when designing and implementing policies in Peru. This is because it has some inherent risks for the economy. For example, an unexpected sharp domestic currency depreciation may have negative consequences on the economy through the well-known balance sheet effect.

In order to reduce financial dollarisation risks, there are some policy responses that can be implemented. One of them is to moderate excessive exchange rate volatility. The Central Bank of Peru (BCR) intervenes in the foreign exchange market to moderate excessive exchange rate volatility, with no target concerning its level. Therefore, these are leaning against the wind interventions.

This paper reviews forex interventions in Peru under inflation targeting (2002-04). The motives for foreign exchange interventions are explained in section 1. The most recent periods of significant forex interventions in Peru are described in section 2. Section 3 outlines the effectiveness of BCR interventions in the foreign exchange market. Finally, some concluding remarks are stated in section 4.

## 1. Motives

The BCR has an inflation targeting (IT) framework for monetary policy. Consistent with this scheme and with free capital mobility in the economy, the exchange rate needs to be flexible in order for the BCR to be able to implement an independent monetary policy that aims at attaining its inflation target (2.5 percent, with a maximum tolerated deviation of one percentage point above and below the target).

However, policies must take into consideration the high degree of financial dollarisation, both to control its inherent risks and to promote the role of the domestic currency as store of value. Although financial dollarisation has been steadily decreasing in the last few years, the degree is still high. By the end of 2004, 55 percent of broad money and more than 70 percent of credit to the private sector were denominated in foreign currency.

Financial dollarisation causes two types of mismatches in the balance sheet of economic agents (Baliño et al (1999)): maturity and currency mismatches. Regarding the latter mismatch, it causes the private non-financial sector to face an exchange rate risk. This is because its income is basically denominated in domestic currency, while it has debts in foreign currency. Thus, an unexpected large domestic currency depreciation may trigger the alarm on the solvency of the private non-financial sector, thereby increasing the financial sector's credit risk.

The financial sector, on the other hand, has a maturity mismatch that is related to the fact that it has short term liabilities in foreign currency, while its assets in the same currency have a larger average maturity. Although this type of liquidity risk is common to banking systems, the risk in a financially dollarised economy is higher because the central bank does not issue foreign currency.

Certain policies have been implemented to deal with financial dollarisation risks in the Peruvian case (BCR (2003)). They aim at reducing it or at assuring the availability of liquid funds in a contingent financial sector foreign currency liquidity crisis.

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<sup>1</sup> The views in this paper are those of the author and do not necessarily represent those of the BCRP. I wish to thank Francisco Grippa for his valuable contribution to this paper.

Table 1

**Financial dollarisation indicators**

As a percentage of total monetary aggregate

Year	Banking system broad money	Banking system credit to the private sector	Financial system credit to the private sector
1993	69	76	77
1994	64	74	74
1995	63	71	72
1996	67	74	72
1997	65	77	75
1998	69	80	79
1999	70	82	82
2000	70	82	81
2001	67	80	78
2002	65	79	76
2003	62	77	73
2004	55	74	71

One of these measures is to have a high level of international reserves. A high level of international reserves is a buffer stock for supporting the financial system whenever a bank run on a foreign currency-denominated liability occurs. It is also necessary for carrying out eventual forex interventions when there is an unexpected sharp domestic currency depreciation episode.

Table 2

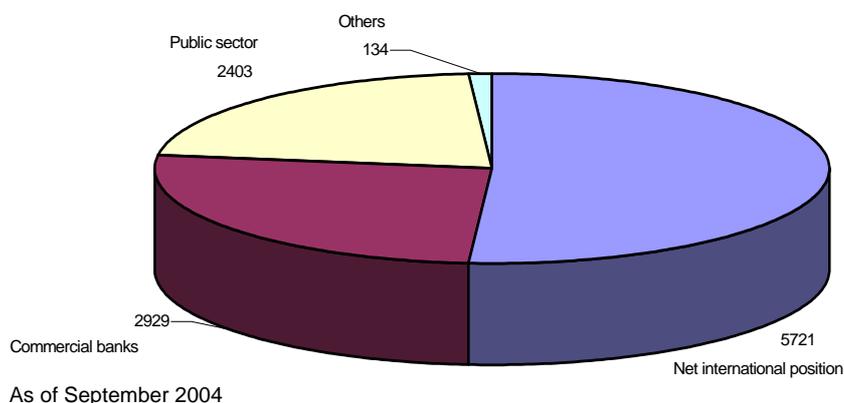
Financial dollarisation risks	Policy responses
Liquidity risk (maturity mismatch)	High level of international reserves
Exchange rate risk (currency mismatch)	High reserve requirements on commercial bank foreign currency liabilities
	Central bank moderates excessive exchange rate volatility
	Inflation targeting framework
	Capital market development in domestic currency

A criticism to keeping a high level of international reserves is the moral hazard that is present in every insurance. Given that there is a high probability that the central bank would use the international reserves to provide liquidity in the "bad state of nature", the financial system may fail to internalise dollarisation risks. In Peru, the financial system has a high reserve requirement on foreign currency liabilities (about 30 percent), which reduces this perverse incentive.

These deposits are part of BCR net international reserves. Approximately half of net foreign exchange reserves are borrowed, in the sense that this part of international reserves corresponds to central bank foreign currency domestic liabilities: 27 percent are commercial banks' foreign currency deposits at the BCR (mainly as part of reserve requirements), while 22 percent are government deposits. This proportion of borrowed reserves has been declining over the last two years, given that the central bank has been purchasing foreign currency in the market in 2003 and 2004 to smooth the appreciating trend of the Peruvian sol.

## Net international reserves

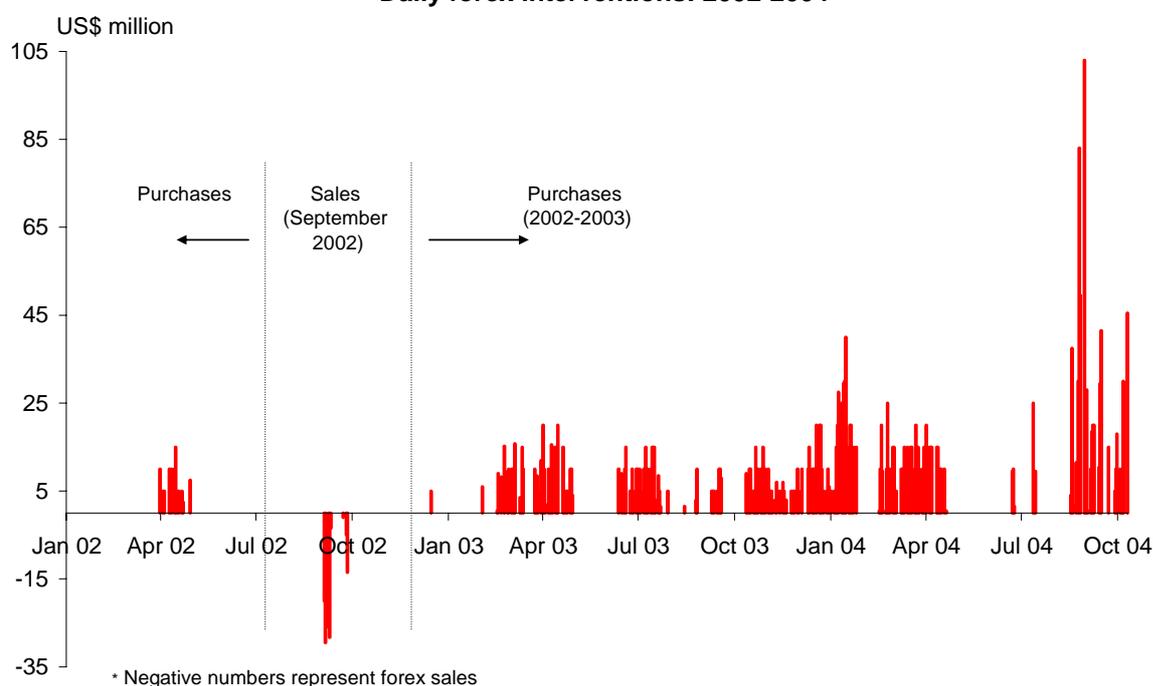
In US\$ million



Other mechanisms to reduce financial dollarisation risks are the implementation of an inflation targeting framework for monetary policy and the development of the local capital market in domestic currency.

Finally, the BCR has the policy of moderating excessive exchange rate volatility. Forex interventions lean against the wind, with no target concerning the exchange rate level. This smoothing goal relates to the rate of change of the exchange rate, as measured in a low frequency. The empirical evidence shows that the BCR does not change the sign of interventions (from buying to selling, or vice versa) from day to day.

## Daily forex interventions: 2002-2004



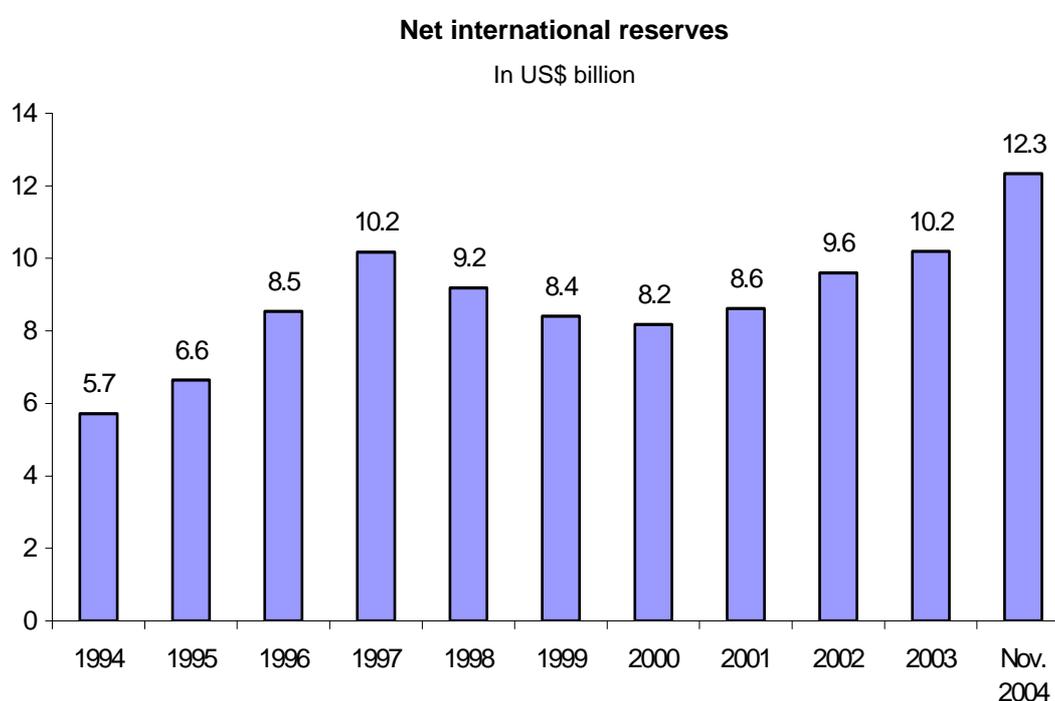
There is no commitment to a fixed or stable exchange rate because that would be inconsistent with the IT framework. Moreover, it would probably lead to a moral hazard problem: economic agents may fail to internalise the inherent currency risk of financial dollarisation if they perceive that the central bank is providing them with an implicit foreign exchange insurance through forex interventions targeting an exchange rate level.

In addition, Ize and Levy-Yeyati (1998) presented a portfolio model of financial intermediation in which currency choice is determined by hedging decisions on both sides of a bank's balance sheet. Dollarisation hysteresis is shown to occur when the expected volatility of the inflation rate is high in relation to that of the real exchange rate.

In this way, although excessive exchange rate movements are risky in a financially dollarised economy (balance sheet effect), it is also convenient to let the exchange rate float because that is an incentive for economic agents to dedollarise. In turn, lower dollarisation reduces the risks of higher exchange rate variability.

BCR foreign currency sales have been useful to show markets that foreign currency would be provided if necessary, especially in an episode of financial turmoil, like the one in September 2002. They counteract any overreaction and smooth the path of the exchange rate.

Foreign currency purchases, on the other hand, have also allowed the increase of net international reserves (NIR) from US\$ 9.6 billion in December 2002 to US\$ 12.3 billion in November 2004.



The high level of international reserves has had some positive impact on credit ratings by reducing the probability of a domestic financial crisis, acting as an “insurance” against the latter. The higher the insurance, the safer the country seems. The importance of this is greater when considering the expected increase in US interest rates, which in the past have caused significant capital outflows in Latin American economies.

This precautionary policy of accumulating international reserves looks forward to a period of increasing interest rates in foreign markets (2004-06) and to the upcoming domestic general elections (first semester of 2006). A high net international reserves balance reduces the risks of increased uncertainty that usually come along with general election periods, particularly in emerging markets.

This NIR accumulation has allowed the improvement of international liquidity indicators, such as the ratio of coverage of short term external liabilities and broad money, in the last two years.

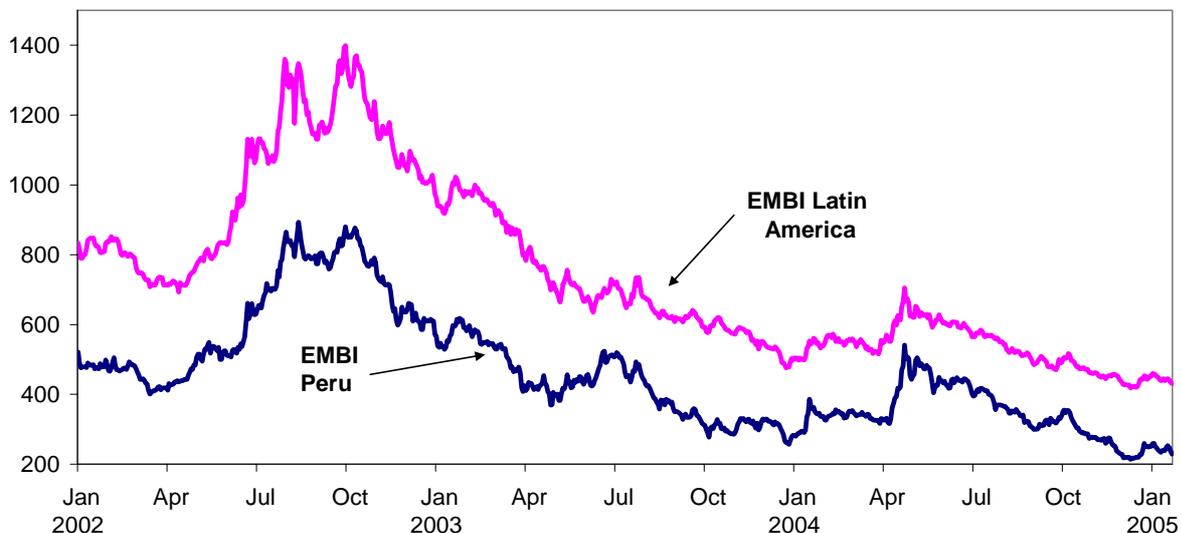
Table 3  
International liquidity indicators

	2000	2001	2002	2003	2004
NIR/short term liabilities	1.5 times	1.7 times	2.2 times	2.2 times	2.3 times
NIR/imports of goods and services	13 months	14 months	16 months	15 months	15 months
NIR/banking system broad money	61%	61%	65%	67%	69%

## 2. Forex interventions in 2002 and 2003-2004

The increased uncertainty over the election process in Brazil and the higher risk aversion of international investors due to default events in the U.S. capital market boosted Peru's country risk during the second and third quarters of 2002, as the following graph shows. This caused a rise in domestic currency depreciation expectations, encouraging the demand for foreign currency hedging assets. The BCR adopted measure to calm the market overreaction and reduce exchange rate volatility.

Sovereign Risk  
(January 2002 - February 2005)



The rise in the demand for foreign currency hedging assets showed up in the relatively new forex forward market, developed by commercial banks in the mid 90s. In periods of higher exchange rate volatility, as in 1998-99 (Russian and Brazilian crises), 2002 (uncertainty over political elections in Brazil), and 2004 (significant terms of trade increase), the average outstanding stock of forex forward contracts has been larger.

Table 4

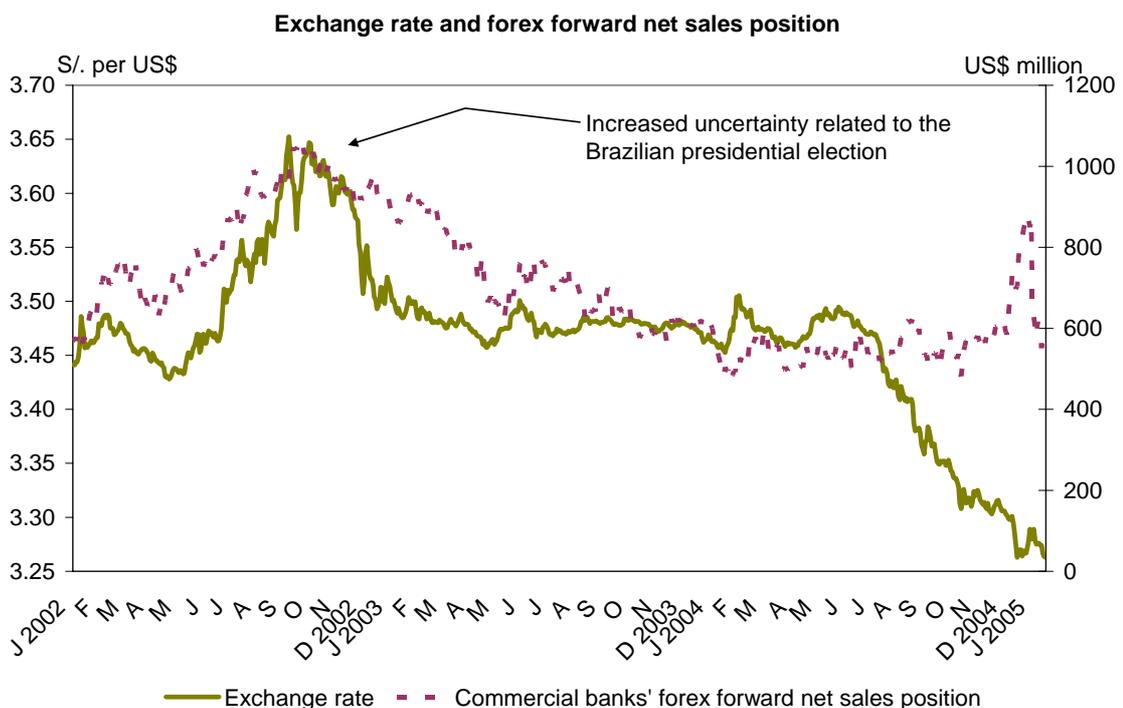
**Forex forward market**

Average outstanding stocks, in US\$ million

	Purchases	Sales	Purchases + sales	Exchange rate standard deviation (S/cents)
1998	267	779	1047	12.5
1999	149	548	696	7.2
2000	192	648	841	2.8
2001	398	929	1326	4.8
2002	317	1151	1468	6.6
2003	222	937	1159	0.9
2004	449	1014	1463	7.4

Source: BCR.

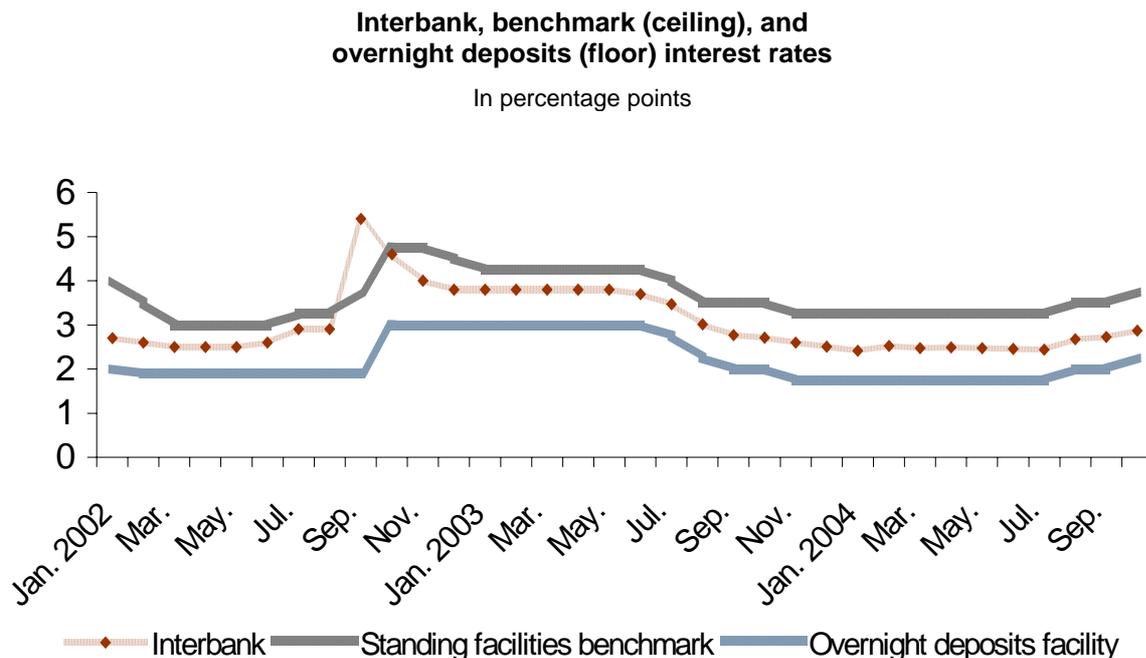
The Peruvian forex forward market is asymmetric. Forward sales of foreign currency are far greater than forward purchases. This may reduce the scope of using this market for hedging purposes in periods where there is a strong pressure for the domestic currency to depreciate. When there is a drastic increase in domestic currency depreciation expectations, commercial banks sell forex forwards and buy foreign currency in the spot market in order to hedge the former operation, which causes the exchange rate to rise. This can be noticed in the following graph: the forex forward net sales position began to increase in the third quarter of 2002, and the exchange rate followed the same pattern; when it decreased in the fourth quarter of the same year, the exchange rate followed shortly after.



Between May and September, Peruvian sol/US\$ exchange rate fluctuations were closely related to those of the Brazilian real/US\$. In this period, the Peruvian domestic currency depreciated 5.8 percent, even though there were no macro fundamental reasons for this to happen.

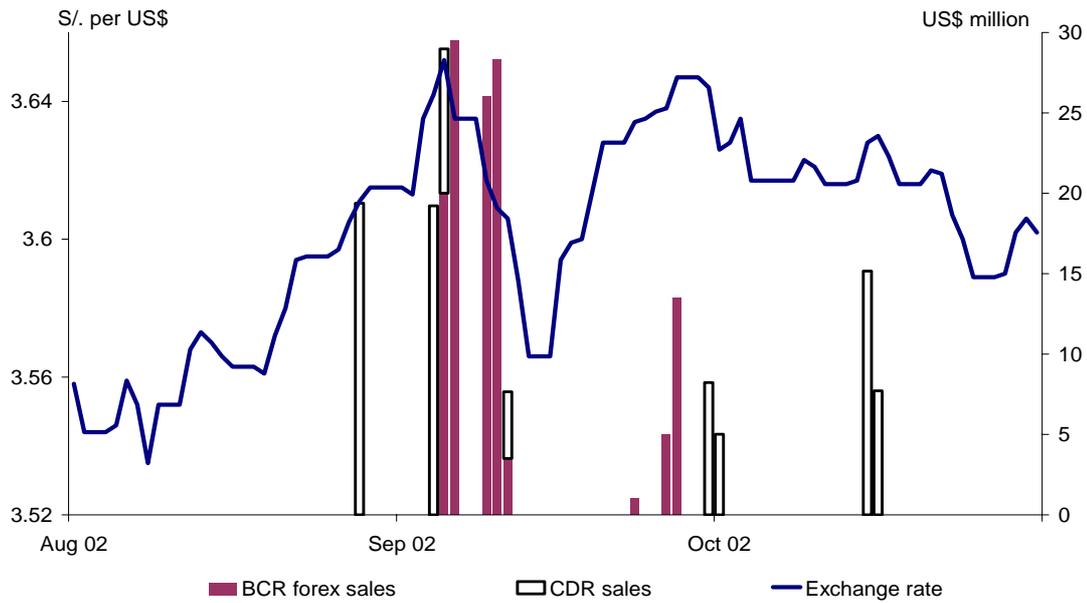
The central bank intervened in the foreign exchange market to counteract the overreaction and smooth the path of the exchange rate. At the same time, the central bank transitorily increased the policy interest rate in order to moderate the sharp exchange rate variability by increasing the cost of domestic currency funds that were being used to buy foreign currency.

The interbank interest rate increased from 2.6 percent in June to 2.9 percent in August, and to 5.4 percent in September.



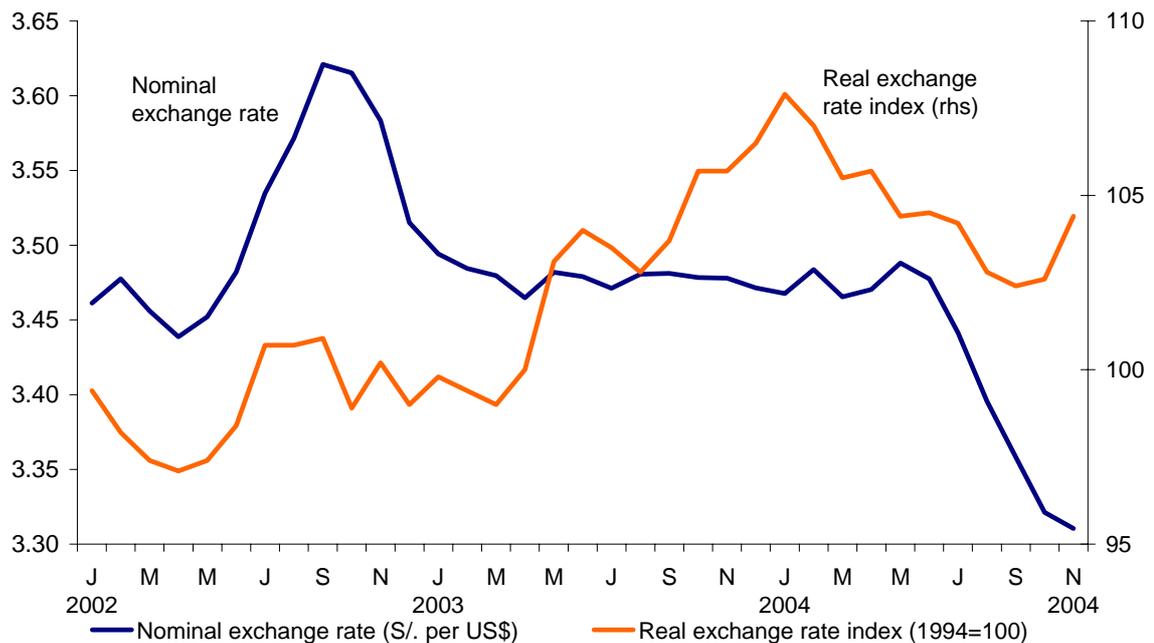
On the other hand, the higher foreign currency assets demand was matched with forex sales that added up to US\$ 127 million during September. In addition, between the end of August and mid-October, the central bank sold approximately US\$ 90 million in CDR. These CDR are securities denominated in domestic currency, but adjusted for foreign currency price movements. Thus, they were aimed at providing the market with a hedging asset and, in this way, lowering the pressure on the exchange rate. This market instrument is also used in Brazil and Chile. The amount of CDR issued between July and October 2002 was relatively low (0.16 percent of 2002 nominal GDP and 0.3 percent of the average daily turnover in the forex market). Since 2003 there have been no CDR in the market.

### Exchange rate and BCR forex intervention in 2002



These measures allowed the exchange rate to smooth its upward trend. The Peruvian sol depreciated 1.7 percent against the US dollar in August and 0.8 percent in September. In October, uncertainty over the Brazilian presidential election fell and the Peruvian economy began to be differentiated from the other economies in the region thanks to its better macro fundamentals (GDP growing at rates of more than 4 percent, inflation below 2 percent, and fiscal deficit continuously reducing). These made possible the reduction of depreciation expectations, so that the interbank interest rate declined to 4.6 percent in October, while the exchange rate decreased 1.2 percent in October and 2.6 percent in November. The benchmark standing facilities interest rate was then reduced from 4.75 percent in October and November to 4.5 percent in December.

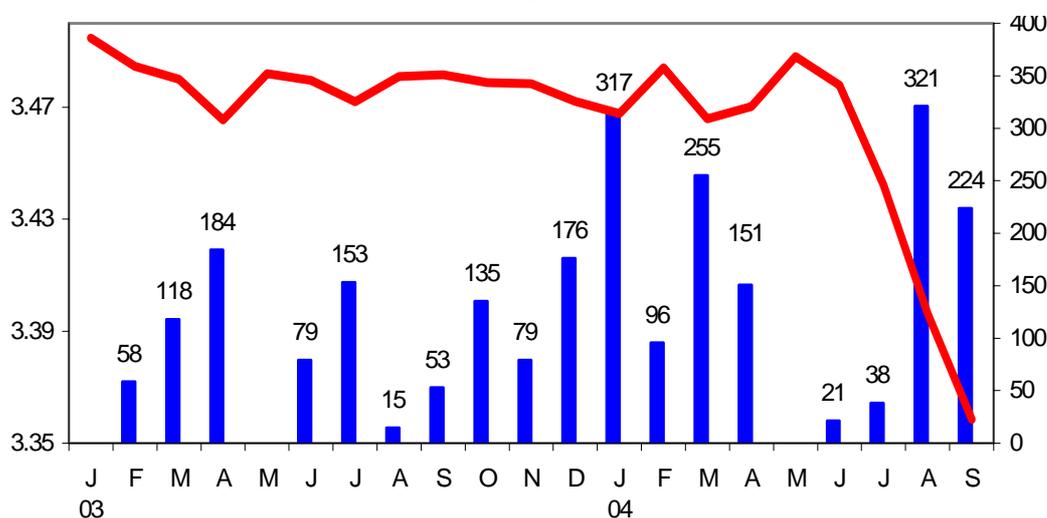
### Nominal and multilateral real exchange rate<sup>1</sup>



<sup>1</sup> An increase means that the domestic currency depreciates.

Since 2003 there has been a domestic currency appreciation trend. Peru is not alone in this process: all other major currencies in the Latin American region are facing the same process. The reasons are related to the weakness of the US dollar in international markets and to positive results in the Peruvian external sector.

**Nominal exchange rate and BCR monthly forex interventions (purchases): 2003-04**



During this domestic currency appreciation period, forex interventions have mainly taken place when appreciation pressures on the domestic currency significantly increased due to portfolio movements from foreign to local currency, aiming at smoothing the exchange rate fall.

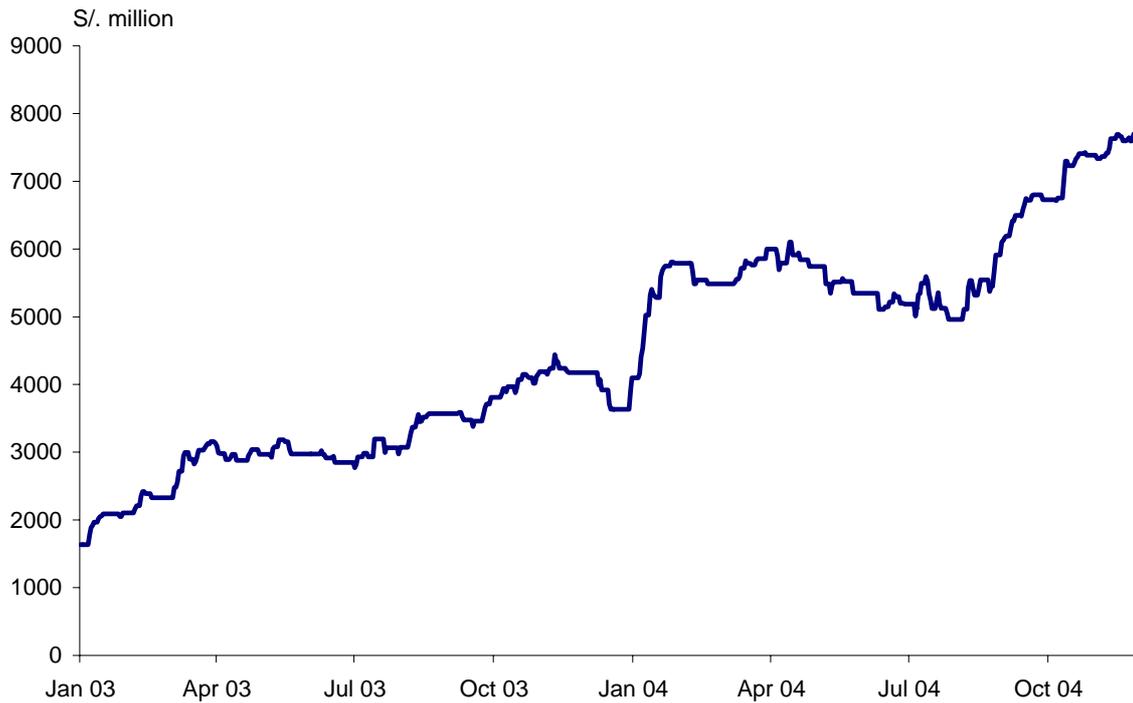
Since the beginning of 2003, the BCR has purchased around US\$ 3.1 billion (as of 30 November 2004) in the foreign exchange market. This has allowed the strengthening of the BCR's international reserves position and made it possible to accommodate portfolio movements in a context of steady financial dedollarisation.

Forex interventions have also allowed the BCR to accumulate US\$ 2.7 billion in net international reserves, relative to December 2002. Thus, the stock of NIR reached a balance of almost US\$ 12.3 billion in November 2004, the highest ever recorded. It is an important buffer stock against any disruption in the economy, considering that, for instance, it is more than twice the stock of the due-in-one-year external debt (debt in foreign currency with non-residents).

These forex interventions have been sterilised. The central bank uses the daily interbank interest rate as operational target for controlling monetary conditions. Banking reserves demand that is consistent with the operational target is satisfied via repo operations or issuing BCR securities (CDBCRP). In this way, daily monetary operations aim at keeping the interbank interest rate at the level set by the central bank (policy target level).

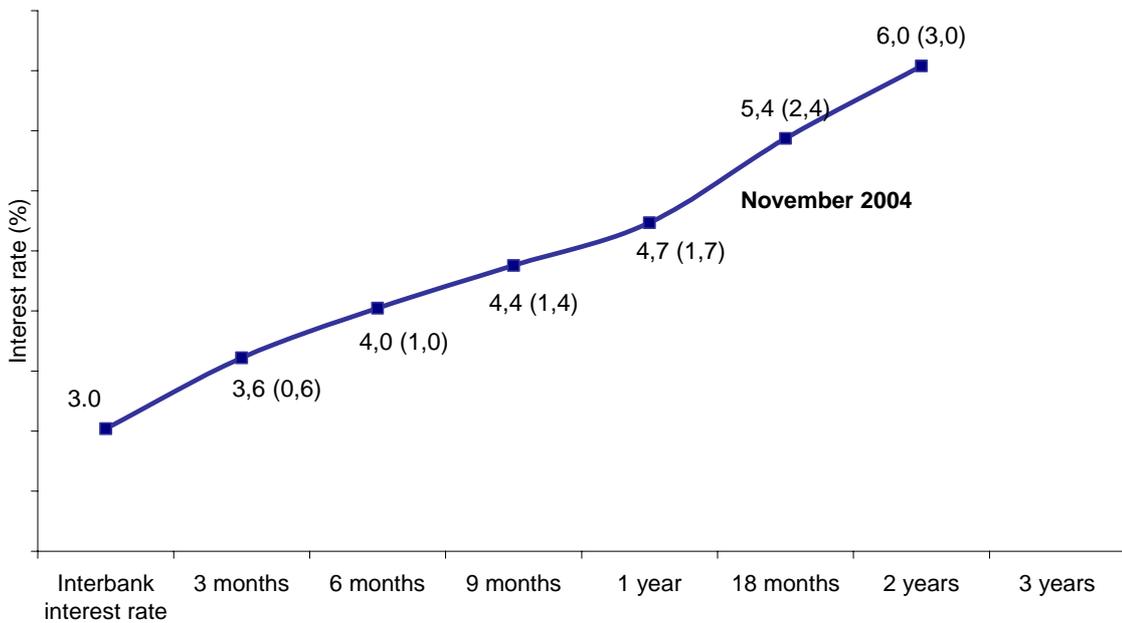
However, forex purchases may imply that supplied banking reserves are greater than reserves demand. This would cause a downward pressure on the interbank interest rate. Therefore, foreign exchange interventions in 2003-04 have had to be sterilised with CDBCRP in order to avoid the deviation of the interbank interest rate from the policy target level. The stock of CDBCRP has increased from S/ 2.0 billion (1.0 percent of 2002 nominal GDP) to S/ 8.3 billion (3.5 percent of 2004 nominal GDP) between the end of 2002 and the end of 2004.

### BCR securities stock



These securities are issued with maturities ranging from one week to three years. In November 2004, for example, the average interest rate for 3-months-maturity CDBCRPs issued in that month was 3.6 percent, while that for CDBCRP with a maturity of two years was 6.0 percent.

### CDBCRP yield curve<sup>1</sup>



<sup>1</sup> Numbers inside brackets are spreads relative to the interbank interest rate.

Maturity

A risk related to sterilised forex purchases is that the interest rate on the securities used to sterilise is higher than that the central bank receives from its foreign exchange investments.

The central bank has the authority to determine the exchange rate regime, to conduct the exchange rate policy, and to decide on interventions in the foreign exchange market. In this sense, any cost due to the intervention is solely of the central bank, with no cost being allocated to the government. However, if the BCR's net worth turns out below legal capital, the Charter Law calls for the Treasury to issue bonds in favour of the central bank.

### **3. Effectiveness of forex interventions**

Although financial dollarisation increases the vulnerability of the economy to depreciation-induced balance sheet problems, it seems to have made forex interventions less difficult. Given this high financial dollarisation, the amount of domestic currency in the economy is smaller than it would otherwise be. Therefore, it is less difficult for the BCR to influence the exchange rate with a relatively small intervention.

The estimates for the average daily turnover in the foreign exchange market decreased from US\$ 297 million in May 2002 to US\$ 261 million in May 2003 and to US\$ 216 million in May 2004. Although forex interventions have been relatively frequent since the beginning of 2003 (the BCR has conducted foreign exchange interventions on approximately 47 percent of business days between January 2003 and September 2004), the average size of foreign exchange interventions has been relatively small (US\$ 7.1 million as of September 2004) relative to the average daily turnover in the forex market.

In addition, it is possible for the BCR to estimate supply or demand pressures on the forex spot market, and thus forex volatility arising from portfolio currency movements can be readily identified. If an intervention is necessary, it is made in the wholesale spot market (operations are done just with commercial banks). The BCR does not intervene in the forex forward or swap markets.

These forex interventions are not pre-announced. However, ex-post, data on forex interventions are available at the end of the day on which the intervention has taken place. These data can be found on the BCR's website ([www.bcrp.gob.pe](http://www.bcrp.gob.pe)). There is information on the amount of the intervention and on the exchange rate of the forex operation. Moreover, a general statement on reasons behind any eventual FX intervention decision is published in the Inflation Report issue that immediately follows the operation.

Usually, when the BCR intervenes in the forex market, the media put special emphasis on the amount of the intervention. This seems to be the most relevant information, and is like a signal of the "strength of the decision" to smooth the path of the exchange rate. Thus, it seems that the central bank influences the exchange rate basically through the expectations channel (particularly the expectations about future interventions).

In this sense, the BCR "wants to be seen" when it intervenes. The intervention gives the signal that there is excessive exchange rate volatility in the market and that the BCR is going to take the appropriate measures to calm it down. This does not mean, however, that the central bank plays the role of a market maker in the foreign exchange market.

In the case of the portfolio balance channel, the intervention is most likely to be effective when there are anticipated and one-time portfolio currency movements. Otherwise, the effectiveness of the intervention through this channel is low.

Internal studies on the effectiveness of official forex interventions provide empirical evidence that central bank foreign exchange interventions have been effective in reducing exchange rate volatility. According to Flores (2003) and Azañero (2003), forex selling interventions have been effective around two thirds of the time, while forex buying interventions have been a little bit more effective than that. Thus, BCR foreign exchange interventions have been effective most of the time in achieving their main goal, that is, to calm disorderly markets by reducing excessive exchange rate volatility, without any significant difference in effectiveness when the exchange rate is appreciating or depreciating.

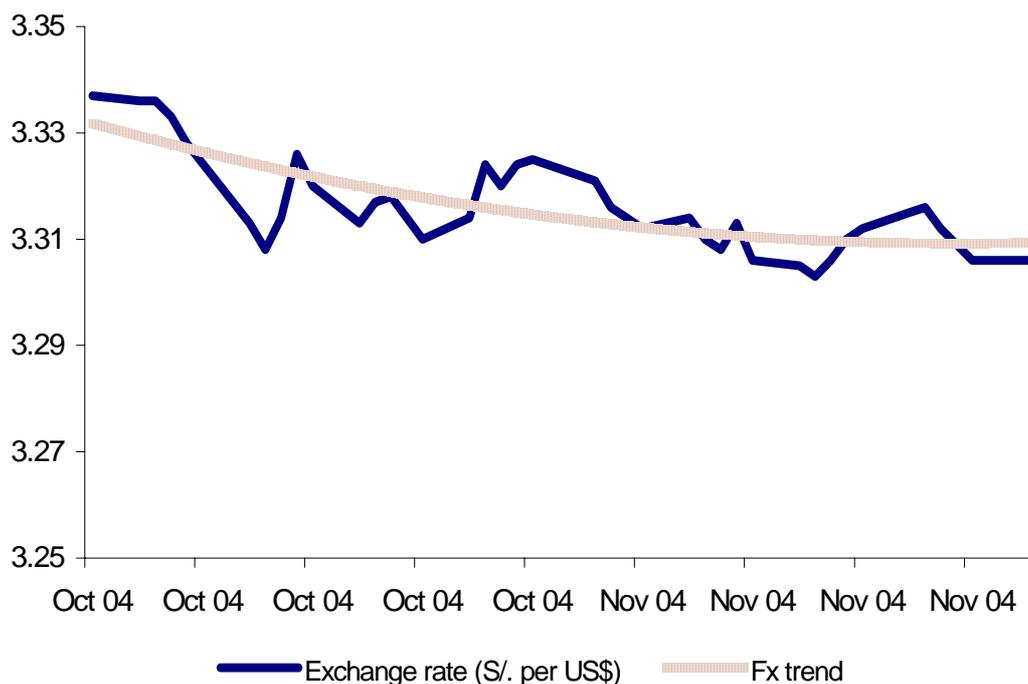
Based on more recent empirical evidence, it may be added that when there have been appreciation pressures on the domestic currency, and forex purchases have been continuous, the effect of the

interventions on the exchange rate seems to have diminished. The explanation to this evidence may be related to the fundamentals that are forcing the appreciation of the Peruvian sol. In this context, forex interventions have tried to smooth - but not stop - the downward trend of the exchange rate in 2003-04. On a shorter horizon (eg October-November 2004), the leaning against the wind goal has been fulfilled.

**Exchange rate: December 2003-December 2004**



**Exchange rate: October 2004-November 2004**



## 4. Concluding remarks

The inflation targeting framework for monetary policy needs the exchange rate to be flexible. However, the design and implementation of policies need to take into consideration that unexpected large domestic currency depreciations are currently too risky for the economy to be tolerated. The reason stems from the fact that there is a high financial dollarisation. Thus, there is a need to smooth the path of the exchange rate.

Forex interventions in 2002 and 2003-04 have succeeded in smoothing the exchange rate path. Additionally, international reserves have increased, which in itself has a positive impact on the reduction of the probability of a domestic financial crisis.

The central bank exchange rate smoothing policy does not aim at keeping a stable exchange rate. If it did, economic agents might perceive that the exchange rate policy supports a stable price for the foreign currency, and this could be taken as an insurance against forex risk from investing in foreign currency assets. This risk insurance would favour financial dollarisation.

In order to keep the interbank interest rate at the policy target level, the central bank needs to sterilise forex purchases. These sterilisation operations imply some costs, which the BCR has had to manage.

## References

Armas, Adrián (2003): "Exchange rate regime and monetary policy under an economy with partial dollarization: the case of Peru", in P Van der Haegen and Jose Viñals (eds), *Regional Integration in Europe and Latin America, Monetary and Financial Aspects*, Banco de España and European Central Bank.

——— (2004): "Monetary policy in a dollarized economy: two years of inflation targeting experience in Peru", in research meeting *Strategies for implementing monetary policy in the Americas: the role of inflation targeting*, Federal Reserve of Atlanta.

Azañero Saona, J M (2003): "Dinámica del tipo de cambio: una aproximación desde la teoría de la microestructura del mercado", *Revista de Estudios Económicos*, Banco Central de Reserva del Perú, no 9, March.

Baliño, Tomas J T, Adam Bennett and Eduardo Borensztein (1999): "Monetary policy in dollarized economies", *Occasional Paper* no 171, International Monetary Fund.

Banco Central de Reserva del Perú (2003): *Protecting the economy against vulnerabilities created by partial dollarization*.

——— (2002): *2002 Monetary Programme*, January.

——— (2002): *Annual Report*.

——— : *Inflation Report: evolution and perspectives*, several editions (June 2002, September 2002, January 2003, May 2003, August 2003, and January 2004).

Flores Bahamonde, Miguel (2003): "Un análisis de las intervenciones del Banco Central de Reserva del Perú en el mercado cambiario: 1999-2001", *Revista de Estudios Económicos*, Banco Central de Reserva del Perú, no 9, March.

Goldstein, M (2002): *Managed floating plus: the great currency regime debate*, Institute for International Economics.

Gulde, Anne-Marie, David Hoelscher, Alain Ize, David Marston and Gianni De Nicoló (2004): "Financial stability in dollarized economies", *Occasional Paper* no 230, International Monetary Fund.

Ize, Alain and Eduardo Levy-Yeyati (1998): *Dollarisation of financial intermediation: causes and policy implications*, International Monetary Fund.

Reinhart, C, K Rogoff and M Savastano (2003): "Addicted to dollars", *NBER Working Paper Series*, October.

Webb, Richard and Adrián Armas (2003): "Monetary policy in a highly dollarized economy: the case of Peru", in P Ugolini, Andrea Schaechter and Mark Stone (eds), *Challenges to Central Banking from Globalized Financial Systems*, International Monetary Fund.