TRENDS AND POLICY TRADE-OFFS OF CAPITAL FLOWS IN LATIN AMERICA AND THE CARIBBEAN: 2003-2008

ALEJANDRO JARA
and
CAMILO E. TOVAR[1]

ABSTRACT

This paper reviews trends in capital flows in Latin America and the Caribbean between 2003 and mid-2008 and its implications for monetary policy and financial stability. The financing structure that emerged during this period was more benign than in the past, due to a greater share of foreign direct investment and reduced reliance on foreign financing. Although traditional monetary policy trade-offs remained present, policy implications shifted partly due to changes in the monetary transmission mechanism. Financial stability focus on currency and maturity risk shifted to focus on credit, liquidity and market risk.

JEL classification: E4, E5, E6, F0, F2, F3, G1, G3, H6 and O1.

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[1] E-mail addresses: Alejandro Jara (alejandro.jara@bis.org) and Camilo E. Tovar (camilo.tovar@bis.org). Bank for International Settlements.

The views expressed are those of the author and do not necessarily represent those of the Bank for International Settlements. This is a revised version of the paper entitled "Monetary and Financial Stability Implications of Capital Inflows for Latin American and the Caribbean". We thank Már Gudmundsson and Ramon Moreno for their comments to a previous version of this paper, research assistance by Rodrigo Mora and Sergio Vargas, and Sandra Gonzalez who kindly helped us revise the text. We also thank seminars participants at 2008 LACEA Annual Meeting in Rio de Janeiro, Brazil, and participants at the 40th Annual Monetary Studies Conference in Basseterre, St. Kitts.

1.0 Introduction

From 2003 until mid-2008, emerging markets economies (EMEs) witnessed a phase of capital flows characterised by large gross inflows; incipient gross outflows; a reduction of external liabilities positions; and improved net international positions. In contrast with the past, when capital flows were mainly financing current account deficits, this time around, the surge of capital inflows resulted in a sharp accumulation of international reserves, due to a benign external environment and the implementation of improved domestic policies.[2]

This paper analyses the monetary policy and financial stability challenges associated with the increase of capital flows in Latin America and the Caribbean (LAC) between 2003 and mid-2008.[3] From the monetary policy perspective, it emphasises the potential changes in the monetary transmission mechanism associated with the adoption of new monetary policy frameworks and the development of domestic capital markets. On the financial stability side, it emphasizes that the main sources of financial vulnerability associated with capital inflows have changed in recent years. The traditional focus placed on the foreign currency mismatches and maturity mismatches generated by the surge of capital flows has moved to other sources of financial instability, such as the credit, liquidity and market risk, as well as concerns of international contagion.

Following this introduction, section 2 reports the main trends in gross and net capital flows and in gross and net international investment

[2] The 2008-09 global crisis did not have a major impact in LAC until the third quarter of 2008. For an overview of such impact in Latin America see Jara et al (2009).

[3] For the purpose of this paper, we divide LAC in three sub-sections: Latin America (Argentina (AR), Bolivia (BO), Brazil (BR), Chile (CL), Colombia (CO), Ecuador (EC), Mexico (MX), Paraguay (PY), Peru (PE), Suriname (SR), Uruguay (UY) and Venezuela (VE)), Central America (Belize (BZ), Costa Rica (CR), El Salvador (SV), Guatemala (GT), Honduras (HN), Nicaragua (NI) and Panama (PA)), and the Caribbean (Antilla (AN), Antigua and Barbuda (AG), the Bahamas (BS), Dominica (DM), the Dominican Republic (DO), Grenada (GD), Haiti (HT), Jamaica (JM), St Kitts and Nevis (KN), St Lucia (LC), St Vincent and the Grenadines (VC), and Trinidad and Tobago (TT)).

positions (IIPs). Section 3 discusses the implications for monetary and exchange rate policies of increasing capital flows. It also analyses the desirability and effects of sterilised foreign exchange interventions, and how other policy instruments, such as fiscal policy and stabilisation funds, might assist monetary policy in dealing with adverse macroeconomic consequences of strong capital inflows. Section 4 discusses the implications for financial stability, in particular those arising with exposures to exchange rate, liquidity, or credit risk or with international contagion. Finally, section 5 presents some concluding remarks.

2.0 Dynamics of capital flows in LAC during 2003-2008

Macroeconomic environment

LAC experienced an unprecedented cycle of economic growth with macroeconomic stability between 2003 and mid-2008. Economic growth averaged 5.5% in 2007, compared to 1.5% during 1998–2002, inflation trended downwards, reaching a regional average of 6.2% in 2007, and fiscal deficits declined to 1.4% of GDP, down from 2.2% during 2003–05.[4] Public debt in the region declined from 60% of GDP in 2003–06 to 49% in 2007, while external debt fell from 40% to 25% of GDP during the same period as a result of the increasing primary surpluses, which averaged 2.9% in 2007, and the improvements in the management of public debt.[5]

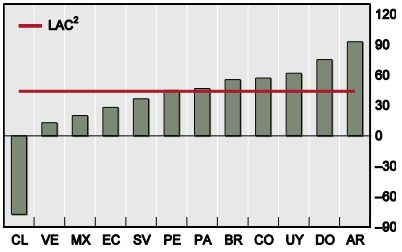
[4] Some studies argue that, when adjusted for cyclical factors, fiscal positions did not improved much, because there was a substantial increase in government spending associated with the boom in commodity-related revenues (IMF (2007a)). Alternatively, it was shown that in the region only Chile has a structural fiscal surplus (IADB (2008)).

[5] Antigua and Barbuda, Bahamas, Guatemala, Honduras, St Vincent and the Grenadines and Venezuela are the only countries in the sample registering negative primary balances.

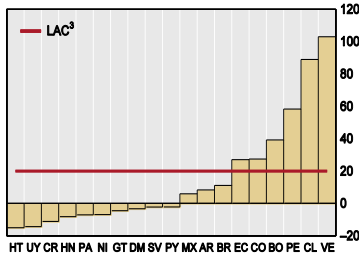
Graph 1
Sovereign spreads and terms of trade

In percent

Decline in spreads, 2003-07[1]



Change in terms of trade, 2003-07



[1] Decline in the average December spreads of the JP Morgan EMBI Global index.
[2] As measured by JP Morgan Chase.
[3] Weighted average of listed countries based on 2000 GDP and PPP exchange rates.

Sources: ECLAC; JP Morgan.

The external financing environment was extremely favourable, as ample liquidity in global financial markets and investors' low risk aversion pushed sovereign spreads to historic lows (Graph 1, left-hand panel). Some economies in the region also benefited from terms of trade improvements, in particular exporters of minerals (Chile and Peru) and fuels (Bolivia, Colombia, Ecuador, Trinidad and Tobago and Venezuela). In contrast, the smaller economies of the Caribbean and Central America saw their terms of trade deteriorate (Graph 1, right-hand panel).

Financial integration

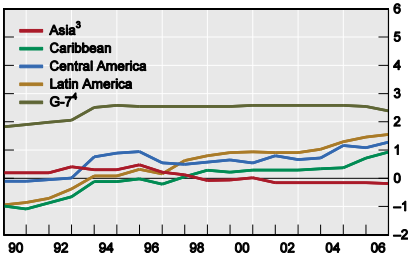
The degree of financial integration across the world has increased over the past 15 years (Garcia-Herrero and Wooldridge (2007)). Graph 2 displays two indicators of financial integration for LAC regions: a "de jure" measure (left-hand panel) and a quantity-based or "de facto" measure (right-hand panel).[6] As shown, with the exception of Central

[6] "De jure" measures of financial openness are based on the IMF's classification of restrictions in capital mobility. They take into account the presence of

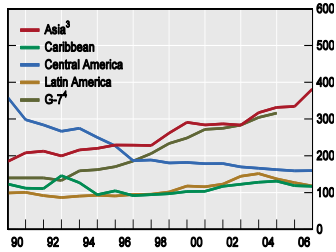
America, both measures support the conclusion that financial integration has increased in LAC.[7] Nevertheless, the region is far from reaching the levels of integration seen in the most developed economies, mainly those of the G7. The evidence is less conclusive regarding the relative progress made vis-à-vis other emerging markets, such as Asia. Indeed, while legal restrictions seem to be more prevalent in Asia, the quantity measure seems to indicate that Asia is more financially integrated with the rest of the world than LAC (Graph 2, right-hand panel).

Graph 2
Measures of Financial integration

Capital Opennes[1]



Gross international investment position[2]



1 An increase indicates a higher level of openness to cross-border capital transactions; average of listed countries.
2 Foreign assets plus foreign liabilities, as a percentage of GDP.
3 Includes China, India, Indonesia, Malaysia, the Philippines and Thailand.
4 Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

Sources: Chinn and Ito (2007); Lane and Milesi-Ferretti (2007); IMF; BIS staff calculations.

multiple exchange rates, restrictions on current and capital account transactions, and the requirement to surrender export proceeds. The index is then calculated as the first standardised principal component of these categorical measures (Chinn and Ito (2007)). Therefore, the more open the country is to cross-border capital transactions, the higher the values it takes on. By construction, the mean of the index over the sample period is zero.

7 Despite its relatively high openness in "de jure" terms, openness measured by the gross international investment positions in Central America has tended to decline. This is possibly explained by the fact that official flows played an important role in this part of the world during the 1980s. As official aid has receded, it would lead to a decline in the measured degree of openness.

Trends and composition of capital flows

Gross flows

Gross inflows to the region increased since 2003, reaching an all-time high of $208 billion in 2007. Inflows to Latin America accounted for the bulk of the increase: they grew by 334% during this period, reaching $194 billion in 2007. This is double the amount in 2006 and the highest level of inflows since 1990. By the first half of 2008 capital inflows to Latin America slowed, but continued to grow in some countries such as Argentina, Brazil, Chile, Colombia and Mexico. In the Caribbean, gross capital inflows more than doubled during the 2003–2007 period, reaching $6.2 billion in 2007, while in Central America these flows grew by 86%, to $8.1 billion.

Reliance on gross FDI inflows was greater than on external portfolio investment (Graph 3). After slowing in the first half of this decade, FDI consistently increased, reaching an estimated $97 billion in 2007 (2.8% of the region's GDP). FDI played a more prominent role in the Caribbean, representing over 5.6% of GDP in 2007, followed by Central America (4.3% of GDP) and Latin America (2.7% of GDP). However, in this last case the FDI to GDP ratio declined. In Central and Latin America, portfolio flows were on average less relevant than in the early 1990s, although they expanded at the end of this cycle (Graph 3). Thus, in 2007 LAC's gross portfolio flows reached 24% of total inflows ($50 billion) vs. 47% in 1990–97. However, in few economies portfolio flows continued to be a relevant source of funding, exceptions being El Salvador (5.0% of GDP) and Barbados (4.6% of GDP), because these flows are heavily concentrated in the largest economies in the region. In fact, Brazil and Mexico alone accounted for 87.8% of all portfolio flows to the region in 2007.

A new trend was that of gross capital outflows, which rose sharply in a few years and played an important adjustment role during the 2008 global crisis (Jara et al (2008). Indeed, LAC went from having almost no capital outflows to about $109 billion in 2007. Two elements of the composition of capital outflows are worth highlighting (Graphs 3). First, portfolio and other assets were the main source of expansion of these flows, due in part to the impact of regulatory changes which has allowed

pension funds to be invested abroad.[8] Second, FDI outflows gained importance in some Latin American economies, partly reflecting an increasing intraregional financial integration. Within the region, Chile stands out, as FDI and portfolio outflows reached 2.1% and 9.0% of GDP, respectively. Bolivia, Colombia and Peru also saw an expansion in portfolio outflows. In the Caribbean, trends were dominated by Trinidad and Tobago, where other assets have reached an outstanding level of 5.5% of GDP and portfolio outflows 16% of GDP. In Central America, however, gross outflows remain almost non-existent.

Net flows

Net capital flows to the region increased to $98.6 billion in 2007, from an annual average of $53.1 billion in 1990–97, but down as a percentage of GDP (to 2.9% from 3.3%). Thus, the region relied less on net external financing to support economic activity than in the past (Graph 3). In Central America net capital flows increased during the 2003-2007 period, reaching record levels in dollar terms, but remained quite stable as a percentage of GDP (around 5.7% on average in 2003–07).

Notwithstanding a sustained increase during the period of analysis, net flows to the Caribbean remained below the levels of the late 1990s both in absolute levels and in terms of output. Lastly, in Latin America, net capital flows traced a U-shaped behaviour. They fell in a sustained manner between 1998 and 2006, and increased sharply in 2007. Overall, most countries displayed positive net flows, with the exceptions of Belize, Bolivia, Chile, Ecuador, Suriname and Venezuela. Net capital inflows in a number of smaller economies easily exceed 9% of GDP.[9] In addition, net flows have been dominated by the behaviour of private capital flows, highlighting the reduced relevance of official flows.

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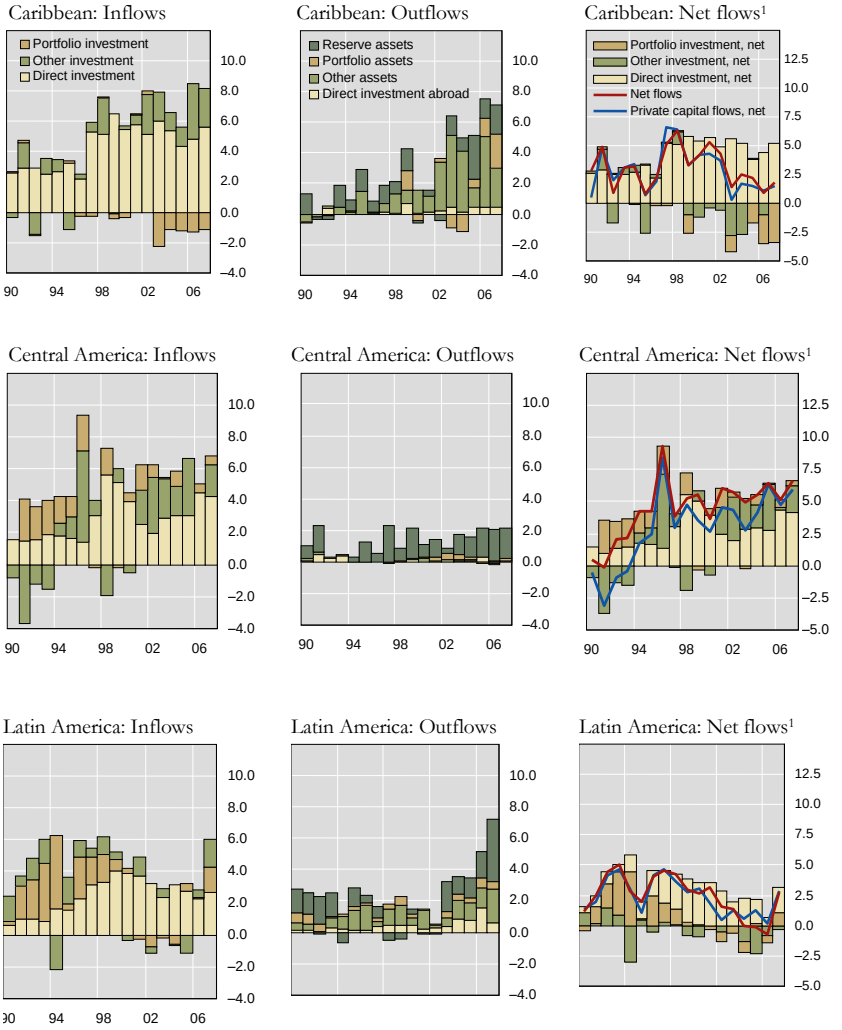
[8] Outflows in other assets include, for example, domestic financial sector foreign currency denominated assets held abroad, and non-financial sector deposits in foreign entities.

[9] For example, Antigua and Barbuda (16.5%), the Bahamas (17.9%), Dominica (9.7%), Grenada (16.9%), Nicaragua (12.6%), St. Kitts and Nevis (30.2%), St. Lucia (15.6%), St. Vincent and the Grenadines (21.4%).

Graph 3
Financial account: capital inflows and outflows
As a percentage of regional GDP



1 A positive figure indicates a positive capital inflow to the region. Net flows are the total of the net figures of direct investment, portfolio investment and other investment.

Source: IMF, World Economic Outlook.

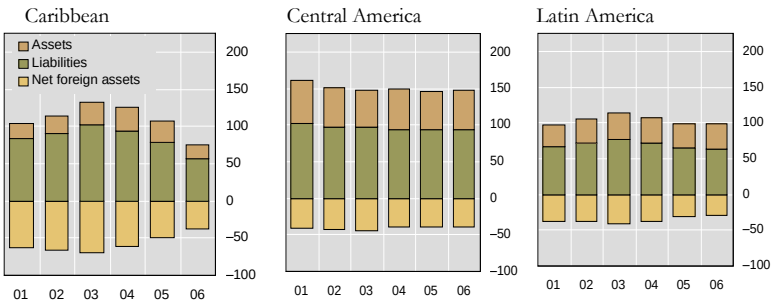
Gross and net IIPs[10]

In the Caribbean, liability positions declined sharply from 100% of GDP in 2003 to 55% of GDP in 2006, thus reducing its net debtor position to about 38% of GDP. In Latin America, the trend is similar, but the improvement was less dramatic (Graph 4). Debt has declined in other regions, with the exception of Central America, where liabilities were stable as a percentage of GDP.

Cross-border asset holdings increased rapidly in the region, reflecting to a large extent an accumulation of international reserves. Nonetheless, in Latin America, FDI assets abroad have more than doubled, while the stock of portfolio investment overseas has almost tripled, reaching $116 billion in 2006. However, as a percentage of GDP increases are less evident. In Central America asset holdings as a percentage of GDP have declined, but portfolio holdings still represent 13% of GDP.

Graph 4
International investment position

As a percentage of regional GDP



Sources: Lane and Milesi-Ferretti (2007); IMF; BIS staff calculations.

[10] Increasing international financial integration has been associated with changes in the composition of cross-border holdings. Countries' portfolios are now such that fluctuations in exchange rates and asset prices cause very significant reallocations of wealth across countries. See Lane and Milesi-Ferretti (2007).

Driving factors

The changes in the structure of flows and IIPs across the region reflect both external (push) and domestic (pull) influences. After 2003, a benign ***external environment*** characterised by low real interest rates worldwide and decreased levels of risk aversion compressed sovereign spreads on the region's external debt to historically low levels (see Graph 1). In addition, high commodity prices improved the terms of trade for the region and significantly increased export revenues.

On the other hand, domestic policies also improved and the marginal propensity to save increased. This is evident in the reduction of debt ratios, the unprecedented current account surpluses observed in some economies and the increased levels of international reserves. Although precise conditions vary in individual countries, policy changes include: the shift towards moderately countercyclical fiscal positions (achieved by saving a large part of increased revenues from growth and high commodity prices and generating significant primary surpluses); improvements in public debt management that reduced currency and maturity mismatches; more credible monetary and exchange rate frameworks; and better supervisory frameworks.

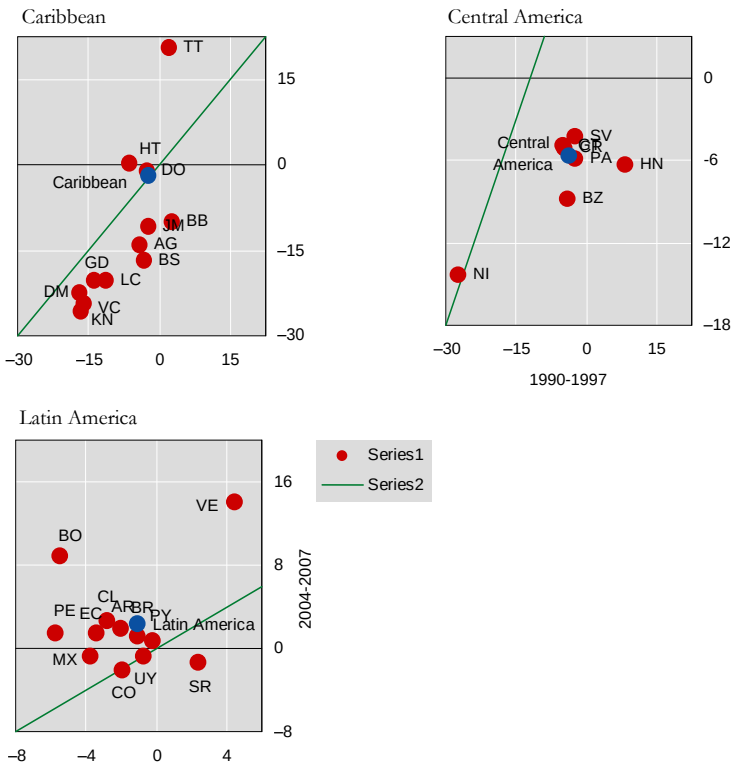
The combination of favourable external conditions and improved domestic policies and their associated contribution towards an extended period of growth and economic and financial stability increased the attractiveness of the region to foreign investors.

Net capital inflows, current account and international reserves

Net capital flows have two natural counterparts in the balance of payments: reserve accumulation and/or the financing of current account deficits. In the past, capital flows to LAC mainly financed current account deficits. However, in recent years LAC's current account balances turned to surpluses (Graph 5), which, along with capital inflows, resulted in surpluses in the *overall balance* (of payments) and large accumulation of international reserves. Between 2003 and 2006 the region accumulated over $116 billion, equivalent to almost 3.9% of the region's GDP. Furthermore, in 2007 reserves in the region grew by a further $135 billion.

Graph 5
Current account

As a percentage of GDP



Current account surpluses between 2003 and 2007 were concentrated in few economies, mainly those of Latin America (Graph 5). LAC went from having an average deficit of $36 billion (2.2% of the region's GDP) in the 1990–97 period to a record surplus of $46 billion (1.5% of GDP) in 2006. However, much of this outcome was due to Venezuela and, to a lesser extent, Brazil.[11]

[11] Venezuela alone registered between 2004 and 2007 an average current account surplus of $22.9 billion (14% of its own GDP). If Brazil, Mexico and Venezuela are excluded, Latin America's 2006 record surplus of $46 billion shrinks by more than half, to just $7 billion, and in 2007 to minus $2.8 billion.

Current account surpluses can be explained by two main factors: i) rising terms of trade (associated with increases in commodity prices, particularly of oil and mining products); and ii) increased worker remittances. However, the importance of these variables differs across the region. Terms of trade improved significantly in Latin American countries but deteriorated in the Caribbean (with the exception of Trinidad and Tobago) and Central America. As for remittances (which are recorded as transfers on the current account), they were larger in the economies closer to the United States, helping offset large trade deficits in the smaller economies of the region.[12]

The combination of current account surpluses and net capital inflows since 2003 led to a large increase in net foreign currency inflows to the region that rivalled the explosion of foreign currency inflows observed in the 1990s (Graph 6). However, while in the past foreign currency inflows were entirely the result of capital inflows, this has changed as remittances now play a very prominent role.

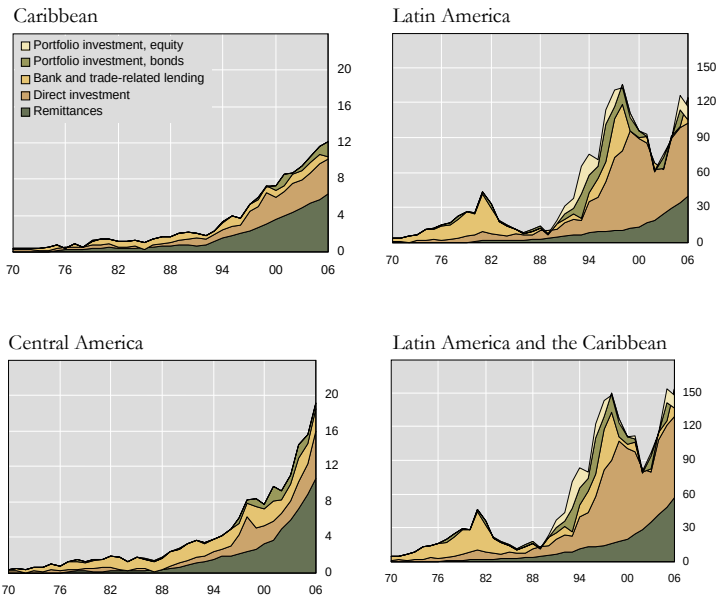
3.0 Implications for monetary and exchange rate policies

Capital inflows pose significant challenges for monetary authorities. A key issue is that more open capital accounts impair the ability of monetary authorities to implement an independent (of external factors) monetary policy. For example, with rising inflation pressures many countries see a need to tighten monetary policy. However, raising domestic interest rates can attract more capital inflows and accentuate currency appreciation pressures, dampening competitiveness and growth.

[12] A third of the total remittances to the region went to Mexico.

Graph 6
Net capital flows and remittances

In billions of US dollars



Source: World Bank, *World Development Indicators*.

In dealing with these challenges, policymakers have to confront several issues: i) What is the appropriate monetary framework or exchange rate regime? ii) To what extent should central banks intervene in foreign exchange markets and how much should such interventions be sterilised? iii) Should other tools be used to contain the expansion of monetary aggregates (e.g. increased reserve requirements)? iv) What role can fiscal policy play in counteracting the effects of such capital inflows? v) Can macroeconomic stabilisation funds help deal with inflows? Finally, vi) Should steps be taken to restrict capital flows, via capital controls or other regulatory requirements?

Choice of exchange rate regime

Countries in the region have adopted a variety of monetary policy frameworks and alternative exchange rate regimes to handle the trade-offs associated with the "trilemma" or "impossible trinity".[13] In the Caribbean's smaller islands pegged regimes are preferred, while some of the larger countries have been moving towards more flexible regimes (a notable exception is Trinidad and Tobago). In Latin America, there has been a shift towards formal ("de jure") floating regimes, but important exceptions remain, such as Argentina, Bolivia, Ecuador and Venezuela. Finally, in Central America, chosen regimes range from floating (Guatemala) to fully dollarised ones (El Salvador).

The choice of an exchange rate regime has varied implications for the "trilemma" of monetary policy as well as for the manner in which capital inflows might affect the economy. Under pegged regimes, capital inflows may overheat the economy more directly than under flexible exchange rates, as central banks increase domestic liquidity when purchasing the excess foreign currency at the prevailing exchange rate. This in turn may increase aggregate demand, resulting in higher inflation and real exchange rate appreciation. In contrast, under a flexible exchange rate regime, the impact of capital inflows would tend to be reflected in an appreciation of the nominal and real exchange rates, dampening any expansionary stimulus of capital inflows. Despite the increasing preference for adopting inflation targeting (IT) regimes with floating exchange rate arrangements, there is evidence of "fear of appreciation" among some central banks in the region. In these countries, capital inflows have been associated with growing appreciation pressures, excessive nominal exchange rate volatility, as well as with claims of significant exchange rate overvaluation.[14]

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[13] The "trilemma" or "impossible trinity" states that a country cannot simultaneously target or stabilise the exchange rate, conduct an independent monetary policy, and maintain an open capital account (see Obstfeld et al (2004), Obstfeld and Rogoff (1995), and Aizenman et al (2008)).

[14] The main exceptions were Mexico and, to a lesser extent, Chile, where the improved fiscal position supported the free float.

How much foreign exchange market intervention? [15]

The appreciation pressures associated with surges in capital inflows raised several concerns: i) the potential adverse impact on the competitiveness of the exports and the tradable sector; ii) the dampening effect on interest rate increases and the upward pressures on non-tradable prices; and, finally, iii) the fact that appreciation pressures can easily reverse, putting upward pressure on interest rates. In response to these concerns, several central banks in the region responded by intervening in foreign exchange markets, which resulted in heavy and persistent foreign reserve accumulation (Table 1).[16]

To assess the extent of central bank intervention, we use a measure of central bank resistance to exchange market pressures (EMP) which captures whether excess demand for domestic currency (ie appreciation pressure) is met through exchange rate changes or reserve accumulation. In particular, a resistance index is calculated, in which a higher value indicates greater resistance to EMP via reserve accumulation (left-hand panel in Graph 7). Formally,

$$EMP_{i,t} = \frac{\Delta s_{i,t}}{\sigma_{\Delta s_{i,t}}} + \frac{\Delta IR_{i,t}}{\sigma_{\Delta IR_{i,t}}} \qquad \text{(Eq. 1)}$$

Where $\Delta s_{i,t}$ and $\Delta IR_{i,t}$ are the annual percentage changes of the nominal exchange rate and the international reserves in country *i* and year *t*, respectively. While, $\sigma_{s_{i,t}}$ and $\sigma_{IR_{i,t}}$ are the standard deviation of the monthly changes in the nominal exchange rate and international reserves in period *t*.[17]

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[15] See Moreno(2005) and BIS (2005) for a general discussion.

[16] Some central banks limited the use of discretionary intervention and resorted to other measures. The Central Bank of Mexico only intervened in the second half of 2008 as a response to the global crisis. The Central Bank of Chile began to intervene in the foreign exchange market in April 2008 to accumulate international reserves. See Jara et al (2009) for a discussion of intervention after Lehman's bankruptcy in September 2008.

[17] Due to data limitations, interest rates are not considered. See Eichengreen et al (1996) and IMF (2007b) for a similar analysis applied to the global economy.

The EMP shows that excess demand can be met through several (not mutually exclusive) channels, mainly by allowing fluctuations in the exchange rate or adjustments in the international reserves. An exchange rate *resistance index* can then be calculated:

$$\text{resistance}_{i,t} = 1 - \frac{\Delta s_{i,t}}{\sigma_{\Delta s_{i,t}} \cdot \Delta IR_{i,t}} \qquad \text{(Eq. 2)}$$

Table 1
Measures of reserves adequacy and interest rate differential

	Foreign exchange reserves[1]		Foreign exchange reserves as a percentage of:[2]						Nominal interest rate differential[5]	
			Short-term external debt[3]		Broad money[4]		Imports			
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
LAC	**215.6**	**441.4**	**177.9**	**285.4**	**34.5**	**40.6**	**53.7**	**70.1**		
Caribbean	**8.3**	**14.1**	**88.7**	**236.0**	**48.2**	**66.4**	**43.4**	**57.8**		
Aruba	0.3	0.4	56.5	158.3	295.4	372.1	295.4	372.1	…	…
Bahamas	0.7	0.5	3.2	1.5	16.3	9.2	21.5	10.8	–0.8	–1.8
Barbados	0.6	0.8	40.0	85.3	24.5	27.4	31.4	35.9	–0.2	1.2
Dominican Republic	0.8	2.4	37.4	94.0	8.6	21.8	8.8	16.1	…	…
ECCU[6]	0.6	0.7	100.1	162.4	21.2	18.8	27.9	27.9	4.4	1.7
Haiti	0.1	0.4	242.8	335.1	7.1	19.2	7.4	19.9	…	…
Jamaica	1.8	1.8	155.6	172.4	57.0	44.9	35.3	23.5	14.1	8.2
Netherlands Antilles	0.4	0.7	2.3	3.3	415.0	661.0	415.0	661.0	2.5	1.1
Trinidad and Tobago	3.0	6.4	123.3	898.7	73.7	98.4	56.8	70.1	3.4	1.4
Central America	**10.3**	**15.9**	**223.4**	**205.1**	**61.7**	**59.6**	**27.6**	**27.3**		
Belize	0.0	0.1	1.8	4.9	7.2	13.9	6.2	12.0	1.9	–1.2
Costa Rica	1.9	4.1	105.2	121.3	23.2	31.4	20.6	29.3	…	…
El Salvador	1.7	2.1	119.9	206.0	192.9	180.6	24.0	21.0	…	…
Guatemala	3.4	4.1	287.7	219.1	35.8	28.8	41.7	33.0	…	…
Honduras	2.0	2.5	508.3	444.8	49.9	41.7	29.3	26.2	…	…
Nicaragua	0.7	1.1	466.9	317.9	39.8	52.5	23.5	23.9	…	…
Panama	0.6	1.9	6.3	9.8	5.4	11.7	14.4	25.6	…	…

Table 2 (Continued)

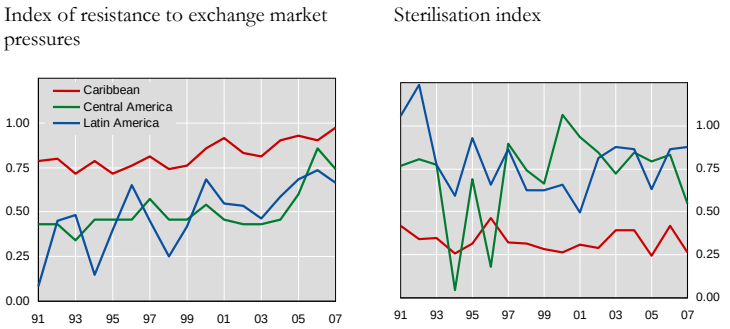
	Foreign exchange reserves[1]		Foreign exchange reserves as a percentage of:[2]						Nominal interest rate differential[5]	
			Short-term external debt[3]		Broad money[4]		Imports			
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
Latin America	**197.0**	**411.4**	**178.4**	**290.4**	**32.9**	**39.1**	**55.2**	**72.4**		
Argentina	18.0	44.2	32.7	291.7	35.3	50.9	64.5	82.7	5.4	6.1
Bolivia	0.8	4.5	297.2	2,670	27.5	98.1	35.1	114.2	6.0	1.6
Brazil	52.5	179.4	129.4	311.5	33.2	51.7	65.5	114.3	15.8	7.1
Chile	15.5	16.7	134.2	93.2	34.4	22.4	52.2	31.0	2.0	1.4
Colombia	12.8	20.1	231.5	207.6	34.7	27.6	64.5	53.3	6.8	4.0
Ecuador	1.0	2.8	91.8	144.6	15.6	27.6	10.2	18.0	…	…
Mexico	62.8	86.3	252.4	296.3	16.7	15.3	29.1	28.1	5.5	2.8
Paraguay	1.0	2.4	152.6	282.3	55.6	78.1	29.4	31.6	…	…
Peru	12.2	26.9	211.8	379.4	71.3	106.2	96.9	115.0	2.1	0.6
Suriname	0.1	0.4	513.0	1,697	0.0	0.0	12.2	22.1	…	…
Uruguay	2.5	4.1	112.3	150.9	22.5	21.4	66.3	61.9	13.4	–0.2
Venezuela	17.9	23.7	386.9	397.5	81.4	30.4	83.0	47.1	11.6	4.5
Memo:										
LAC excluding Brazil and Mexico	*82.5*	*152.0*	*43.7*	*76.1*	*42.1*	*51.3*	*56.2*	*62.1*		

1 In billions of US dollars. 2 Regional aggregates are weighted averages based on 2000 GDP and PPP exchange rates of the listed countries. 3 Defined as liabilities to BIS reporting banks and international bonds with maturity of less than one year; regional aggregates exclude Bolivia and Suriname; data for 2007 up to September. 4 IMF WEO definition. 5 In percentage points; latest data available, defined as the difference between the local and the US Treasury bill rate (line 60c IMF IFS); for Argentina, the local rates are the rates at issue of Lebac notes with a maturity of one year; for Chile, central bank issues with a maturity of two years; for Colombia, TES with a maturity of 182 days; for Peru, government bonds, secondary market; for Venezuela, LT with a maturity up to 91 days.

Sources: IMF; national data.

Where the index of resistance to changes in exchange rates is standardized so that it takes values between 0 and 1, values closer to one imply a greater degree of resistance to exchange rate fluctuations.

Graph 7
Resistance to exchange market pressures and sterilisation coefficient1



[1] Unweighted averages of country-specific indices. See text for definitions.

Sources: IMF, *International Financial Statistics*; BIS staff calculations.

The dynamics of the *resistance index* highlights the following features. First, the Caribbean maintained the highest resistance over an extended period, which is consistent with the prevalence of pegged regimes. Second, in Latin America the index reached levels similar to those displayed in the Caribbean, where pegged regimes are dominant, a clear sign of "fear of floating". Finally, Central America displayed less tolerance to exchange rate pressures. In fact, in 2007 the resistance index reached a maximum for the sample period. Overall, this measure of intervention suggests that LAC countries have been intervening heavily. At a country level, intervention in the foreign exchange market has been common in recent years in Argentina, Brazil, Colombia, Paraguay and Peru.

A common justification for foreign exchange intervention is that in an environment of volatile capital flows, exchange rate fluctuations tend

to induce significant overvaluations in good times, downward overshooting in bad times, excessive volatility in financial markets, and distortions in a country's international specialisation pattern (Ocampo and Vos (2008)). Furthermore, in smaller economies exchange rate movements may be ineffective as shock absorbers or adjustment policy, given that they do not equilibrate the external trade or financial markets in these economies.[18] Some also argue that intervention in foreign exchange markets to restrict exchange rate fluctuations may not necessarily be part of countercyclical monetary policy measures, but rather an element of risk management in the context of incomplete markets that leads to excessive risk-taking. The preceding suggests a tension between the dual objectives of price and financial stability, and could imply incentives for the policymaker to avoid free floating.[19]

Against this, some argue that exchange rate appreciation pressures during the period of analysis were equilibrium responses to stronger fundamentals, which are also aligned with improved policy credibility. This last element is also relevant as it implies that agents should expect better policy reactions to different economic developments and shocks. In fact, a similar argument can be made regarding the development of domestic financial markets. As markets mature, an economy's ability to cope with shocks and other structural changes should improve. Also, there are those who argue that intervention in the foreign exchange market leads to one-sided bets, thus fuelling more capital inflows and

[18] For instance, increases in the relative price of tradable goods do not necessarily shift output to non-tradablec. The reason is that there are only few tradable goods which are subject to capacity constraints, and domestic demand absorbs a very small proportion of production (Worrell (2003)).

[19] Countries also have an incentive to intervene more frequently in foreign exchange markets when (i) policy credibility is low (so that the pass-through from exchange rates to inflation is high); (ii) the financial system is less developed (ie thin and characterised by lack of transparency, so that the perceived distortionary costs of intervention are lower and intervention is more effective); or (iii) the financial sector is weak and exposed to currency mismatches. Furthermore, if risks associated with financial integration have increased, foreign exchange accumulation may also reflect a self-insurance policy, say for instance against sudden stops. See Aizenman (2009a) and Lee (2007b) and Levy Yeyati (2008) for a discussion of the recent reserve surge in the stock of international reserves in developing countries.

more exchange rate pressures. Thus, floating exchange regimes would be superior as they create two-sided bets, which endogenously trigger stabilising mechanisms to avoid the type of snowball effects on exchange rates or capital flows observed in the past. Intervention can also create the perception that the central bank is implicitly guaranteeing exchange rate stability, reducing the incentive to develop and use instruments for managing exchange rate risks. Finally, some believe that intervention is ineffective in influencing the exchange rate level, and that it can increase its volatility.

Foreign reserve holdings have exceeded most rule-of-thumb measures of reserve adequacy, suggesting that self-insurance is not the only motive for reserve accumulation. A disadvantage of foreign exchange intervention is that the associated reserve accumulation can have significant carrying costs. Such costs can be illustrated by a simple measure: the spread between domestic and US Treasury bill rates times the total outstanding stock of foreign exchange reserves in domestic currency. A positive value suggests that central banks experience a loss if they give up high-yielding domestic securities (or borrow in domestic markets) to finance the acquisition of low-yielding US Treasury securities. This last measure does not account for the effects of exchange rate changes on the value of foreign reserves in the central bank balance sheet, nor for the lower spreads on the service costs of the stock of sovereign debt (Levy Yeyati (2008)), which can be significant. The evidence reported in Graph 8 indicates that the carry costs of reserves across the region declined between 2004 and 2007, with the exceptions of Argentina and Barbados. Nonetheless, significant costs remain in some countries. For instance, in Jamaica the carry costs of reserves in these illustrative calculations reached 1.7% of GDP. Also worth noting is the significant decline in the carry cost of reserves in Uruguay, which went from over 2.1% of GDP in 2004 to minus 0.02% of GDP in 2007. Such dynamics reflect the narrowing of interest rate differentials, appreciation trends and the rebound of the economy following the crisis.

Sterilisation

The immediate effect of foreign exchange market intervention is the creation of domestic liquidity (an increase in base money). Central banks have sought to "sterilise" these monetary effects of foreign exchange intervention through offsetting sales of government or central bank securities. To assess the extent of sterilisation, the monthly change of central banks' net domestic assets is regressed on its net foreign assets. Formally, the sterilisation index is calculated by taking the absolute value of the estimated coefficient $\beta_{i,t}$ of the following regression:

$$\Delta NDA_{i,t,m} = \alpha_{i,t} + \beta_{i,t}\Delta NFA_{i,t,m} + u_{i,t,m}$$

(Eq. 3)

Where ΔNDA is the monthly change in the net domestic assets of the central bank in country *i* and ΔNFA is the monthly change in the central bank's net foreign assets in month *m* of year *t*. The estimated coefficient, $\beta_{i,t}$, measures the extent to which a central bank is able to sterilise by contracting domestic credit to offset the expansion of the monetary base associated with the accumulation of foreign reserves. A value of the normalised coefficient equal to (or above) unity implies full sterilisation, whereas a value of zero (or a negative value) represents no sterilisation.[20]

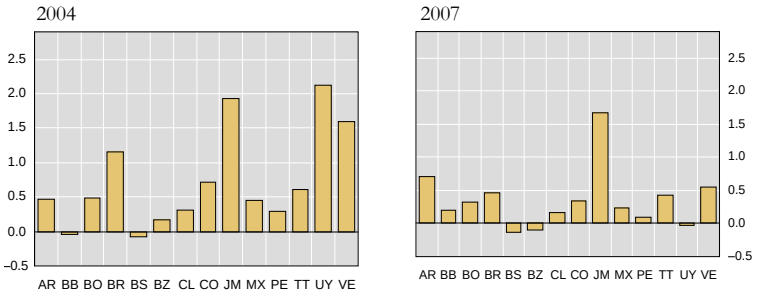
The sterilisation coefficient is reported for the three regions in our sample in Graph 8 (right- hand panel), which shows the following: first, as would be expected of a region where pegged regimes are more widespread, in the Caribbean sterilised intervention was uncommon and sterilisation occurred only in some of the larger islands.[21] Second,

[20] Formally, the coefficient index is normalised so that the coefficient is mapped into a [0,1] index. Therefore negative coefficients are assigned a value of zero and coefficients exceeding the value of one receive a unitary value. Other values are mapped in equal brackets that increase by 0.2 units.

[21] Of course, the distinction between open market operations associated with the normal management of liquidity and those aiming at sterilising the intervention in foreign exchange markets are blurred.

sterilisation of foreign exchange intervention was more widespread in Central and Latin America than in the Caribbean; however, the trend in the most recent years differed. In Latin America the sterilisation coefficient increased, possibly reflecting greater pressures associated with exchange rate appreciation and the need to preserve room for manoeuvre for monetary policy to deal with domestic demand conditions. These results are in line with more formal analysis by Aizenman and Glick (2008), who argue that this is consistent with the potential inflationary impact of reserve flows. Furthermore, they also find sterilisation to depend on the composition of the balance of payments inflows. In particular, sterilisation is less responsive to FDI inflows than to the current account surplus or to non-FDI flows.

Graph 8
Carry cost of international reserves[1]



[1] Defined as the difference in local currency returns of the foreign exchange reserves between the local and the US Treasury bill rate (line 60c, IMF IFS); as a percentage of GDP. For Argentina, the local rates are the rates at issue of Lebac notes with a maturity of one year; for Chile, central bank issues with a maturity of two years; for Colombia, TES with a maturity of 182 days; for Peru, government bonds, secondary market; for Venezuela, LT with a maturity up to 91 days.

Sources: IMF; national data.

Difficulties of sterilised intervention

A number of factors have a bearing on the effectiveness and sustainability of sterilised intervention in foreign exchange markets. The experience of China and other countries shows that sterilised intervention can have a lasting impact on the exchange rate in the presence of capital controls. However, whether sterilised intervention will work in the

absence of such controls is highly contentious. While there is potentially no limit to a country's ability to accumulate reserves, especially if it is small, efforts to sterilise can adversely affect the central bank's profitability and measured capital.[22] Furthermore, large-scale and sustained sterilised foreign exchange intervention might have distortionary effects on the financial sector (Mohanty and Turner (2006)). Furthermore, if capital flows are the result of increased confidence in the economy, so that domestic assets are increasingly seen as good substitutes for foreign assets, then sterilised intervention is likely to be unsuccessful in dampening exchange rate fluctuations.

On balance, in some of the larger LAC economies where sterilised intervention was carried out, there were capital controls in place (Brazil, Argentina) or measures to reduce capital flows were introduced (Colombia and Peru).[23] In Colombia, the difficulty appears to have been that central bank intervention became increasingly ineffective as it was seen as running counter to a (tightening) monetary policy.[24] To deal with this, the central bank in May 2007 imposed marginal reserve requirements on current and savings accounts, as well as on CDs of less than 18 months (27%, 17.5% and 5%, respectively).

In Peru, speculative inflows of capital (on average $500 million per day during the first half of January 2008) prompted the central bank to intervene in the market; it bought $3.27 billion to diminish the volatility and strong appreciation of the sol. Such interventions were sterilised by issuing CDs, which were then sold to foreign investors by domestic banks. In this manner, foreign investors were able to accumulate $2.4

[22] As for intervention to prevent depreciation, it requires the sale of foreign reserves, which are limited.

[23] In Argentina sterilisation has been carried out through different mechanisms: i) anticipated cancellation of rediscounts granted during the 2001–2002 crisis; ii) issuing non-monetary short- and medium-term debt (LEBAC and NOBAC); iii) net issues of reverse repos; iv) sale of sovereign bonds held in the central bank portfolio; and finally, v) changes in the minimum reserve requirements.

[24] See Kamil (2008) for a detailed study on how foreign exchange intervention in Colombia was effective in stemming currency appreciation when foreign currency purchases were done in a period of monetary easing, but became ineffective when incompatible with inflation targeting as the economy began overheating.

billion of secure and high-yielding securities, well above the outstanding holding in December 2007 ($0.89 billion). In the midst of such speculative pressures, the central bank switched to long-term deposits that cannot be sold to foreign investors. Furthermore, reserve requirements on local and foreign currency deposits were put in place to reduce liquidity in the market. The central bank has indicated that these measures were successful in reducing the amount of speculative inflows and that sterilisation measures were equivalent to a 50 basis point increase in the reference rate. Therefore, by avoiding the need to raise interest rates, the central bank claims that it has increased its scope for independent monetary policy.[25]

Effectiveness of capital controls

Maintaining an independent monetary policy is not straightforward in the face of large capital inflows. Furthermore, as discussed above, sterilised intervention can be costly and difficult to sustain. As a result, some countries relied on controls on capital flows. After the crises of the late 1990s and early 2000s controls were slowly dismantled. However, they made a comeback in some countries of the region, mainly in Argentina, Colombia and Venezuela. Brazil also introduced a tax on foreign investments in fixed income. However, at the same time it slowly lifted some restrictions (for instance, the financial transaction tax was eliminated in December 2007). In general, many economies in the region continued to rely on different types of controls, and in some cases they are complemented with additional measures that set limits on derivative positions (for example in Colombia), which reflects the increased deepening and sophistication of financial markets in the region, and the potential complexity in assessing the effects of controls.

Controls on capital inflows come in different flavours: exchange controls or quantitative restrictions,[26] dual or multiple exchange rate

[25] See Jara et al (2009) where it is discussed how the 2007-2008 crisis revealed new vulnerabilities in Brazil and Mexico associated with derivatives exposures.

[26] These restrictions are sometimes presented as prudential regulations. An example is the limits on the share of foreign currency liabilities of domestic commercial banks in their total liabilities.

arrangements (e.g. Suriname), and taxes on financial inflows (Argentina and Colombia). This last type of restriction raises transaction costs by imposing a requirement to deposit a portion of the foreign currency transaction at the central bank, earning an interest rate (which could be zero) determined by the authorities, for a specific period of time. The deposit can be withdrawn at maturity payable in domestic or foreign currency. This scheme, which targets short-term capital inflows, was employed in Chile and Colombia during the 1990s and more recently by Argentina and Colombia. Its objective is to reduce the degree of exchange rate appreciation by reducing the volume of capital inflows, shifting the term structure towards a longer maturity and enhancing monetary control.[27]

The effectiveness of such controls continues to be the subject of debate in academic and policy circles. Although there is disagreement on whether such controls are able to reduce the overall volume of capital inflows, it appears to be accepted that such controls affect the term structure of external debt, by shifting it towards longer-term flows.[28] However, more recent evidence has highlighted that these measures create significant economic distortions. For instance, it has been shown that they make capital costlier for smaller firms, reduce market discipline and lower international trade (Forbes (2007a,b)). Another factor that has become more relevant in recent years is that such controls could delay and distort the development of domestic financial markets.

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[27] Edwards (2005) analyses an important complementary question: whether increased capital mobility heightens macroeconomic vulnerability. He finds no evidence that countries with higher capital mobility tend to have a higher incidence of crises, or tend to face a higher probability of crises than countries with lower capital mobility. In contrast, Edwards (2007) finds that higher capital mobility has a positive, statistically significant and small direct effect on the probability of a country experiencing an abrupt contraction of capital inflows.

[28] For the Chilean experience, see De Gregorio et al (2000), Le Fort and Lehmann (2003) and Forbes (2007a). For the Colombian experience, see Clemens and Kamil (2009); Cárdenas and Barrera (1997), and Ocampo and Tovar (2003). Clemens and Kamil (2009) however argue that the recent Colombian experience shows that controls reduce external borrowing but have no impact on the volume of non-FDI flows. Also that they do not contribute to revert appreciation trends or increase the degree of monetary independence and, finally, that they increase the exchange rate volatility.

Support from other policies

The possible shortcomings of sterilisation policies and capital controls discussed above raise the question of whether other policy tools (such as fiscal policy, stabilisation funds or prudential policies) could support monetary policy in dealing with capital flows.

Fiscal policy and stabilisation funds

Fiscal policy may constitute an effective complementary policy to dampen liquidity and curb demand pressures in the context of large macroeconomic shocks, such as large capital inflows, thus helping monetary policy sterilise these flows. Fiscal policies can do this by acting counter-cyclically, i.e. by authorities running fiscal surpluses in good times (when foreign currency inflows are large), and deficits in bad times (when foreign currency inflows decline or reverse).[29] However, it has potential drawbacks. One is that countercyclical policy may be difficult to implement when non-inflationary financing is difficult to find, thus inducing a procyclical policy bias (see Kaminsky et al (2004)). Furthermore, due to the normal political economy process, fiscal policy (ie reducing expenditures, increasing taxes, or both) may take time to materialise, thus limiting its impact in a context of large inflows, which often requires a swift response. Equally important, its effectiveness may depend on whether expenditure cuts to dampen aggregate demand target the correct sector. For instance, if government expenditure is weighted more towards non-tradable goods, then a cut in government spending may be more effective in alleviating pressures on the real exchange rate than heavier taxation on the private sector. Fiscal policy can also be destabilising, as it may accelerate a reversal of capital flows, in particular if it is perceived to be unsustainable. The improvement seen during the period of analysis in fiscal positions and improved debt management practices, together with the declining debt ratios across the region (see

[29] However, as mentioned in Section 2, some studies have warned that fiscal positions in the region may not be that solid once cyclical adjustments are made (IMF (2007a), IADB (2008)).

Section 1), may contribute to the sustainability of capital flows and, in particular, reduce the probability of sudden reversals.

Many countries in the region received large revenues associated with high commodity prices. Such revenues often fuel the economy with additional liquidity and reinforce appreciation pressures associated with large foreign currency inflows. To offset these effects, countries employed alternative fiscal policies: i) fiscal rules aimed at protecting the government from spending the revenues of commodity booms (eg Chile); and/or ii) macroeconomic stabilisation funds.[30] A problem with both these alternatives is that they have to be set well in advance. Nonetheless, stabilisation funds can facilitate the conduct of monetary policy by investing highly volatile commodity export revenues abroad. These funds commonly referred to as sovereign wealth funds (SWFs) are also part of the broader process of accumulation of foreign assets. They have a greater role in capital outflows.[31] A question of interest is whether foreign asset acquisition by official or quasi-government entities has different implications from reserve accumulation by the central bank in terms of the impact on the exchange rate, possible macroeconomic imbalances, financial market distortions and fiscal costs.

Prudential measures

Sudden reversals in capital inflows have often imposed large costs on the region. Some believe these costs could be alleviated by macro- and micro-prudential policies that could help avoid the build-up of financial imbalances (e.g. unsustainable credit or asset price booms) and also strengthen the financial system to withstand any unwinding of balance

[30] A stabilisation fund has also been established in Trinidad and Tobago and is under consideration in Suriname.

[31] A key characteristic of SWFs is that they are run autonomously from traditional reserve management by central banks and/or finance ministries. Although, an exact and universally agreed definition of SWFs is unavailable, they are considered dedicated government-owned investment vehicles, funded by foreign exchange surpluses, which manage those assets separately from official reserves and invest them with a buy and hold perspective (Griffith-Jones and Ocampo (2008)).

sheet positions.[32] In a setting of low inflation and large capital inflows that trigger a rapid expansion of credit, authorities may be unable to justify interest rate increases. If financial imbalances build up and inflation picks up, monetary authorities will then face the reversal of capital flows in a very awkward position, as any interest rate hike will necessarily have financial stability implications (see Section 4 for a complementary discussion).

Financial integration and monetary policy transmission

An important question is whether increasing financial integration has weakened the interest rate channel of monetary policy transmission in small open economies.[33] Gudmundsson (2008) has explored the relative influence of global interest rates on domestic long-term policy rates for a number of industrial small open economies, finding evidence of a close and strengthening relationship between domestic and US long rates. As a result, the study concludes that the interest rate channel might be getting weaker with financial integration.[34]

However, in the case of LAC, financial sector deepening and improved operating procedures may have strengthened the interest rate channel and made aggregate spending more sensitive to interest rates, although the situation varies from country to country.[35] However, financial intermediation remains low in many of the smaller economies of the region as important segments of the population lack access to

[32] See Borio (2003) and White and Borio (2004) for definitions, comparisons and contrasts between macro- and micro-prudential regulatory and supervisory arrangements.

[33] For a recent overview of the transmission mechanism of monetary policy, see BIS (2008b).

[34] The study recognises possible limitations associated with the fact that strong co-movements in interest rates may reflect other factors, rather than financial globalisation, such as common shocks.

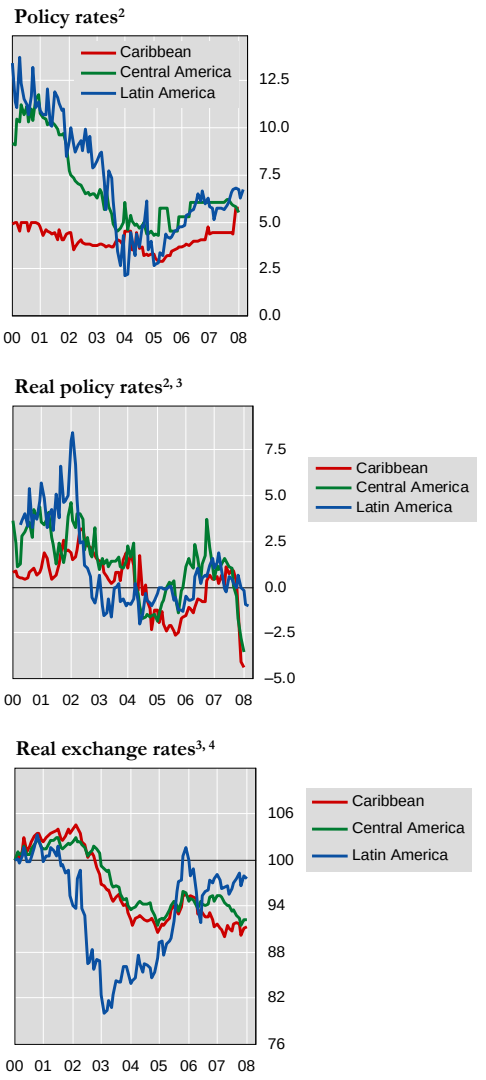
[35] For instance, in September 2007 Uruguay has changed its monetary policy framework. It shifted from one based on monetary aggregates to one based on interest rates. For this purpose, it set an interest rate corridor. New credit and lending facilities were created. The central bank also adopted changes in reserve requirements, which are now mandatory on a monthly basis. Such changes aim at strengthening the interest rate channel (see BIS (2008b), and Tovar and Jeanneau (2008)).

financial services. This might have reduced the direct impact of financial intermediation on aggregate spending. Also, the impact of monetary policy on investment in such economies is uncertain. On the one hand, large firms are more likely to access financing through international markets at rates that are more favourable than those available in domestic markets. On the other hand, the lack of available financing for small and medium-sized enterprises in domestic markets remains a major constraint, forcing such firms to finance investment through their own resources. Nonetheless, the impact of interest rates on aggregate spending is likely to be more significant in the larger economies of the region where financial markets are more developed (see BIS (2008a) and Jeanneau and Tovar (2008)). In fact, the upsurge in credit growth in 2007 in relatively new market segments, such as credit card and mortgage lending, might have increased the responsiveness of aggregate demand to interest rates.

Financial and structural reforms (including the opening of the economy to trade and financial flows) and the changes in the degree of dollarisation may also have altered the exchange rate channel, and therefore the manner in which capital inflows and reversals affect the economy. The evidence suggests that the decline in exchange rate pass-through to inflation together with a decline in currency mismatches (see Section 3) have weakened the exchange rate channel.

Overall, the increasing importance of the interest rate channel and the weakening of the exchange rate channel would suggest that the region is still not fully financially integrated with the rest of the world. Have monetary policy measures been effective? Was monetary policy effective in dealing with the upswing of capital flows? Was monetary policy tight or loose? What were the outcomes in terms of liquidity creation and credit expansion? Interest rates in the region declined considerably during the decade (Graph 9).

Graph 9
Monetary conditions[1]

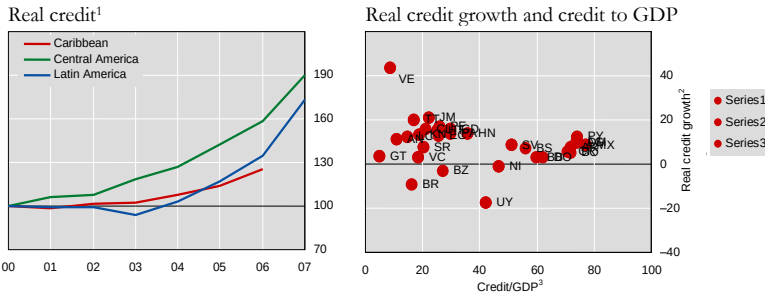


[1] Median of the economies in each group.
[2] In per cent. Monetary policy rates; where not available, money market or deposit rates.
[3] In terms of consumer prices.
[4] January 2000 = 100; an increase indicates an appreciation.

Sources: IMF; BIS; national data.

However, it was not until 2002–03 that the region began to see easy monetary conditions, as reflected in negative real interest rates observed across the region until 2006-07. From mid-2005 central banks across the region began to tighten policy rates; a process that lasted until mid-2008, when inflationary pressures started to push real interest rates down.

Graph 10
Private credit



1 Deflated by consumer prices; 2000 = 100. Median of the economies in each group.
2 Average annual growth from 2004 to 2007 or latest available, in per cent. 3 In 2003, in per cent.

Sources: IMF; national data.

Rapid credit growth across the region, particularly since 2002/03, reinforces the impression of easy monetary conditions (Graph 10). In part this reflects structural factors like financial deepening, as credit/GDP ratios have in some cases been quite low. Indeed, as shown in the right-hand side panel of Graph 10, the pickup of credit was faster in those countries with lower credit to GDP ratios. Short-run factors also boosted credit growth, including strong economic performance and efforts to contain appreciation pressures. Indeed, by contributing to disinflation and lowering aggregate demand, real exchange rate appreciation may have provided room to lower policy rates or adopt other easing measures. Furthermore, appreciation pressures may have been associated with lower interest rates, thus dampening capital flows.

4.0 Implications for financial stability

The trends in net and gross capital flows have potential impacts on the exposure to financial risks facing the region. Increasing capital inflows may increase the vulnerability to foreign currency risk if countries are not able to reduce currency mismatches. In addition, the concerns about the liquidity risk may increase if short-term foreign assets do not keep the same pace as short term capital inflows. Moreover, capital inflows intermediated through the banking system may increase the exposure to credit risk, because they tend to be associated with consumption and credit boom. Finally, a particularly important dimension for small open economies such as LAC, is the emergence of international financial contagion, especially when exposed to the effects of a common lender.[36]

Despite the progress made in terms of the macroeconomic and regulatory frameworks, the financial stability implications of capital inflows remain a concern for LAC, since their financial markets remain underdeveloped, financial dollarisation is still high (BIS (2007b)) and banking systems remain vulnerable to the financial effects of capital inflow reversals. Moreover, financial and real shocks can be sizeable. In this context, several fundamental questions arise: i) How is the financial vulnerability of financial systems affected by the surge of capital inflows? ii) What are the main financial risks arising? iii) How is the domestic financial sector able to cope with capital inflows? iv) What alternatives exist for reducing the risks of contagion and the risks associated with common lenders and/or changes in investor confidence? and, finally, v) What changes in supervision and prudential reforms are needed to address the inherent volatility of capital inflows?

External vulnerability

The capacity of each country to deal with capital flow reversals depends on several factors, such as the degree of real exchange rate

[36] Capital inflows can also affect financial stability in small economies through their impact on the volatility of local financial markets, such as the exchange market, stock markets, money markets, etc.

misalignment; the reliance on foreign savings, the level and growth of foreign debt, the capacity to generate foreign currency revenues, and the ability to pay short-term debt. Graph 11 presents the evolution of an external vulnerability index that takes into account precisely such variables (see Hawkins and Klau (2000)).[37] It shows that the external vulnerability of Latin American countries remained low compared to other emerging economies (right-hand panel), even though it increased prior to the 2008-09 crisis. The main factor contributing to maintain a relatively low regional external vulnerability was the reduction in current account deficits during the first half of the decade, and concomitant reductions in external debt, in terms of both total external debt as a percentage of GDP and short-term debt as a percentage of total reserves.

Despite this improvement, external vulnerability remained a concern for those countries running significant current account deficits (e.g. Colombia and the Dominican Republic). In particular, because such deficits became unsustainable during stress situations, forcing an abrupt correction in the real exchange rate.

External liquidity risk

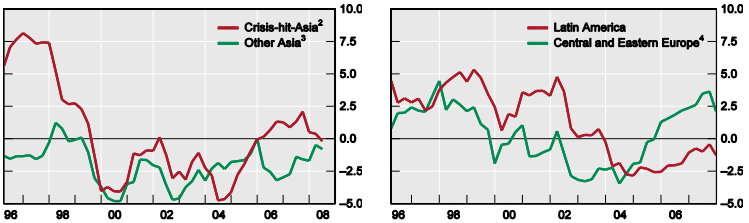
A component of the external vulnerability index that is of particular interest is the ratio of short-term debt to total reserves, an indicator of external liquidity risk. An increase in short-term debt can create rollover or refinancing risk. During episodes of financial stress, agents within the economy (most importantly the government, banks and the corporate sector) owing large amounts of short-term foreign currency debt may find it difficult to refinance their obligations, or may be able to do so at very high interest rates, threatening their repayment ability.

As shown in Table 2, external liquidity risk became less relevant in the period of analysis due to the accumulation of international reserves. Short-term debt as percentage of total reserves has decreased during the

[37] This index of external vulnerability incorporates the real effective exchange rate, the current account balance, export growth and three indicators pertaining to external debt (the ratio of international bond and bank debt as a percentage of GDP –level and change in the debt indicator – and short term debt as a percentage of foreign reserves).

past years in almost all countries in Latin America.[38] An important exception is Chile. However, these apparently reflected the perception that an episode of financial stress which would require much higher reserves is now extremely unlikely. Chilean institutional investors hold significant positions in liquid foreign assets (such as portfolio investment), which could help stabilise the country's liquidity position during a period of stress.

Graph 11
External vulnerability indices



[1] An increase in the index (expressed as a weighted average, based on 2000 GDP and PPP exchange rates of the economies in each group) implies an increase in risk. 2 Includes Indonesia, Korea, Malaysia, the Philippines and Thailand. 3 Includes China, Hong Kong SAR, India, Singapore, and Taiwan (China). 4 Includes the Czech Republic, Hungary, Poland, Russia and Turkey.

Source: IMF; national data. BIS; BIS calculations

[38] For a methodological comparison between BIS and national data see Von Kleist (2002).

Currency mismatches and risk exposures

The degree of balance sheet and income exposures to foreign exchange rate fluctuations (currency mismatches) can pose a serious threat to financial stability.[39] When different agents are engaged in unhedged foreign currency borrowing, and their revenues are mainly denominated in local currency, a sharp devaluation can increase significantly their debt burdens.

Aggregate currency mismatches are often an underlying feature of external debt crises in countries highly dependent on foreign capital. At the sectoral level, mismatches have often been linked with banking crises. The reasons vary. In some cases banks have used deposits to speculate in the foreign exchange market, or have maintained currency mismatches in their balance sheets. In other cases, bank borrowers have maintained large currency mismatches, impairing their ability to service their bank debt in the event of depreciation.

Aggregate currency mismatches

An aggregate measure of currency mismatches is the ratio of foreign currency debt as a percentage of total debt to the share of exports to GDP (Goldstein and Turner (2004)). A large ratio implies that foreign currency debt is high relative to the foreign currency earnings available to service it.

Graph 12 shows this measure of currency mismatches for LAC countries for two different sample periods: 1997–98 and 2007. Although most countries lie above the 45º line, on average there has been an improvement in the currency mismatch positions, as countries have generally moved to the right of the 45º line over the period.[40] Such improvement has been quite visible in Argentina, Brazil, Colombia, Peru and Venezuela. By contrast, currency mismatches have increased in countries like Grenada and St Vincent as their export base has declined.

[39] See a complementary discussion in Jeanneau and Tovar (2008b) and BIS (2007b).

[40] In this figure, a threshold of unity is used to separate the more vulnerable countries.

While lower foreign currency denominated liabilities in a number of countries have reduced their vulnerability to external shocks and improved financial stability, some concerns regarding currency mismatches remain. One is that lower mismatches reflect reductions in external borrowing due to higher fiscal balances and improved public debt management in several countries. However, for some economies this improvement might not be sustained over the medium to long term as better fiscal positions mainly reflect terms-of-trade gains.

Measuring mismatches at an aggregate level also has several drawbacks. On the one hand, it ignores hedging positions and, on the other hand, it can hide potential mismatches at the sectoral level (in particular banking and corporate sectors).[41]

Table 3
Short-term external debt[1]
As a percentage of foreign reserves[2]

	1992–95	1996–99	2000–03	2004	2005	2006	2007[5]
Latin America and the Caribbean[2]	**144.0**	**111.6**	**107.4**	**84.4**	**59.2**	**49.3**	**41.1**
Caribbean[2]	**102.1**	**124.4**	**201.3**	**168.0**	**55.4**	**92.0**	**81.2**
Aruba	64.6	331.8	55.2	177.0	113.0	288.3	73.5
Bahamas[3]	...	...	...	...	...	...	...
Barbados	640.0	233.8	162.9	250.1	111.6	464.1	126.5
Dominican Republic	84.8	144.7	330.4	267.1	63.3	79.4	104.6
ECCU[4]	55.6	193.9	182.8	151.7	114.4	197.9	230.6
Haiti	30.0	24.9	122.7	41.2	18.2	44.1	36.5
Jamaica	52.6	92.3	64.3	64.3	21.1	50.2	54.7
Netherlands Antilles[3]	...	...	...	...	...	...	...
Trinidad and Tobago	126.2	88.3	93.7	81.1	53.7	35.2	11.2
Central America[2]	**118.0**	**75.2**	**62.6**	**55.2**	**53.7**	**54.4**	**49.7**
Belize[3]	...	...	...	...	...	...	...
Costa Rica	217.0	71.5	97.8	95.0	64.1	91.9	87.3
El Salvador	32.9	61.2	70.9	83.4	111.0	66.2	43.8
Guatemala	61.9	99.3	57.9	34.8	30.5	45.4	45.9
Honduras	122.6	78.6	27.2	19.7	18.8	21.1	22.4
Nicaragua	305.8	21.5	32.3	21.4	26.8	21.7	33.5
Panama[3]	...	...	...	...	...	...	...

[41] See discussion in Jara et al (2009)

Table 4 (Continued)

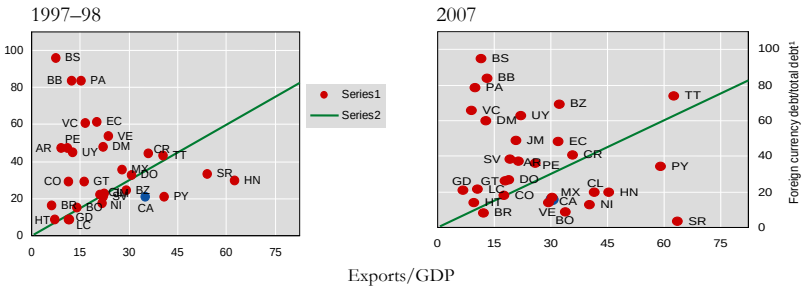
	1992–95	1996–99	2000–03	2004	2005	2006	2007[5]
Latin America[2]	**146.0**	**112.7**	**106.8**	**83.4**	**59.5**	**48.0**	**39.8**
Argentina	155.1	175.5	213.5	305.4	38.5	44.4	36.9
Bolivia	79.3	95.7	95.0	33.6	14.6	4.8	4.2
Brazil	92.2	112.8	109.1	77.3	85.5	54.2	35.5
Chile	53.7	55.4	68.3	74.5	74.5	75.3	111.1
Colombia	57.5	79.0	49.5	43.2	40.4	38.9	49.1
Ecuador	126.3	143.3	207.8	108.9	117.3	129.0	65.2
Mexico	276.9	120.7	89.2	39.6	39.7	41.7	35.8
Paraguay	63.5	77.6	86.5	65.5	49.1	49.9	40.2
Peru	50.1	70.3	83.3	47.2	55.1	43.7	29.7
Suriname	184.8	105.6	40.5	19.5	13.0	6.3	6.7
Uruguay	287.7	220.1	252.0	89.0	79.5	86.2	77.0
Venezuela	59.7	53.0	52.1	25.8	28.7	16.0	28.8

[1] Defined as liabilities to BIS reporting banks and international bonds with maturity up to one year. [2] Weighted average based on 2000 GDP and PPP exchange rates of the countries shown. [3] The ratios for these countries are more than a thousand. [4] Dominica, Grenada, St Lucia, and St Vincent and the Grenadines. [5] Data up to September 2007.

Sources: BIS; IMF.

Graph 12
Indicator of currency mismatch

In per cent



[1] Data for foreign currency debt and total debt up to September 2007.

Sources: IMF; BIS.

Currency mismatches in the banking sector

Currency mismatches in the banking sector have been an important source of financial vulnerability during financial crises (Chile in the 1980s and Mexico in the 1990s). Banking systems' direct exposures to currency risk can be approximated by the ratio of assets minus liabilities in foreign currency to total assets, as shown in Graph 13 for two different sample periods (the average 1990-1997 and 2007). Several features stand out from this regional comparison. In Latin America, the banking system's foreign currency exposures have declined substantially in a number of countries (left-hand panel), suggesting that financial stability has improved in those economies. In Central America banking sector currency mismatches are relatively small, while in the Caribbean several countries present a positive mismatch (higher foreign assets than liabilities).

Nevertheless, direct bank exposures can hide risks faced by banks' borrowers. Therefore, foreign currency risk may still be a concern even if the banking system's balance sheet shows no currency mismatch. For instance, borrowers (non-financial firms and households) may face currency mismatches, and this may expose the banking system to credit risk during periods of stress. In the Caribbean (with the exceptions of Bahamas and Barbados) and in countries like Ecuador and Uruguay, the banking system holds more foreign assets than liabilities. For those countries with pegged regimes the main source of vulnerability is the degree of sustainability of the fixed exchange rate regime.

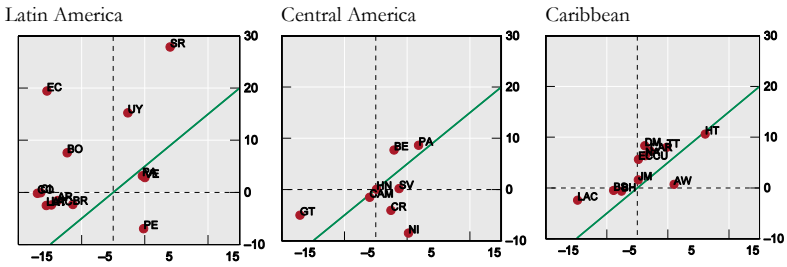
From a prudential perspective, it may be desirable to maintain low levels of currency mismatches. However, some banks, in particular those engaged in treasury activities, might choose to be more exposed to foreign exchange fluctuations, but at the cost of holding higher capital as a cushion for potential losses. This seems to be the case for the Caribbean and Central America, but not in Latin America, as their banking systems are relatively more engaged in the traditional lending-deposit business.

Therefore, a comprehensive analysis of the exchange rate risk should take into account not only direct effects, but also indirect effects

of currency exposures. Unfortunately, data availability is often a limitation for this sort of analysis in many LAC economies.

Graph 13
External positions of banks

As a percentage of total assets



X axis= 1990-1997 average period; Y axis= 2007.
1LATAM=Latin America, CAM=Central America, CAB=Caribbean. Weighted averages based on 2000 GDP and PPP exchange rates of the countries shown.
Sources: IMF International Financial Statistics.

Capital inflows and credit booms

To the extent that capital inflows are associated with an increase in bank lending, bank financing conditions tend to improve. However, this poses a major financial stability concern, as it could increase bank vulnerability to sudden stops in foreign capital and a concomitant credit crunch. Also, if banks have access to inexpensive foreign funding, they may be willing to reduce their credit standards, in particular when competition among local banks is high.

Bank loans grew significantly between 2003 and 2007, particularly in Central and Latin America, where the simple average growth in bank lending to the private sector was above 11.3% for in Latin American countries, and above 12.4% in Central America (although much more moderate than was observed in the early 1990s). In the Caribbean the pattern is more erratic; although the Bahamas and Trinidad and Tobago have experienced sustained double digit annual lending growth rates over the past few years.

This period of strong credit growth can be interpreted as being broadly consistent with financial stability, as is possibly explained by financial deepening related to improvements in regulation and financial infrastructure, the emergence of new financing alternatives such as local currency bond markets and the securitisation of assets,[42] and the increasing presence of foreign banks across the region (see discussion below), which has facilitated credit growth into new sectors by improving risk management practices. Cyclical factors have also played a role, including low interest rates, robust GDP growth and falling or low unemployment.

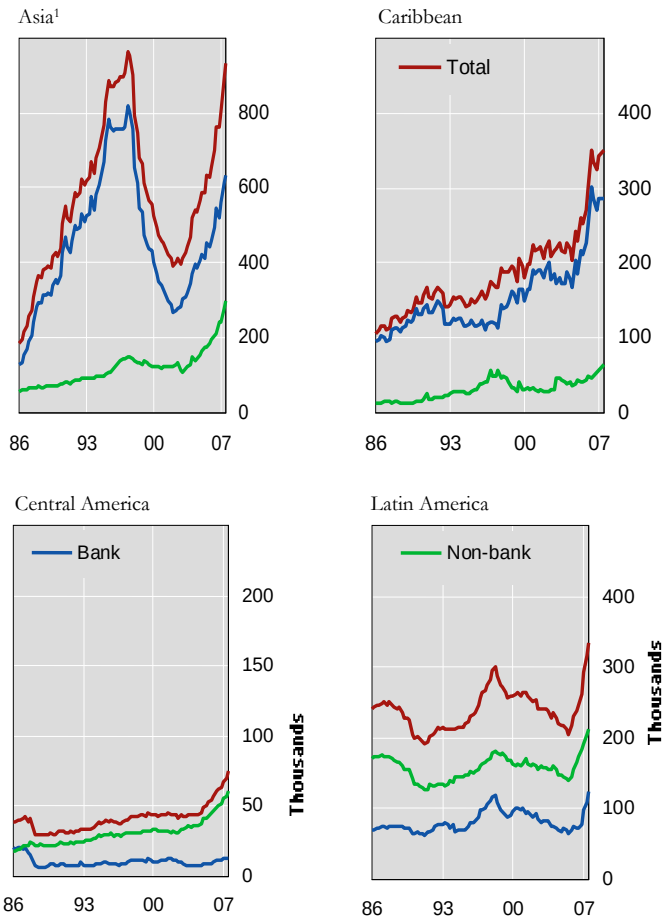
Nonetheless, some central banks, in particular those under an IT framework, may be facing a potential trade-off between price stability and financial stability. Indeed, as central banks threatened by inflationary pressures raise interest rates the financial position of bank borrowers may be impaired. This is a particular concern in underdeveloped financial systems such as those in LAC countries, where borrowers rely heavily on short-term loans from the banking system. Tighter monetary policy also raises domestic interest rates relative to those abroad; creating incentives for banks to borrow from abroad and possibly increasing the financial vulnerability of the banking system (see Section 3).

Cross-border bank lending

The breakdown of cross-border lending by recipient sector (bank and non-bank) is useful for financial analysis purposes, mainly because cross-border flows intermediated by banks can be more sensitive to financial conditions and react more abruptly during financial crises. Graph 14 shows this breakdown for LAC (Asia is included for comparison). It shows that cross-border bank lending to Latin America has increased in recent years, reversing the fall observed between the late 1990s and mid-2000s. Also, cross-border bank lending to Central and Latin American economies is channelled mostly through the non-bank rather than the

[42] For an overview of new financing trends see BIS (2008a) and for one on securitisation in Latin America see Scatigna and Tovar (2007).

bank sector. In fact, in these regions the share of non-bank cross-border lending averaged 82% and 68% during 2004–07, respectively.



Furthermore, during the period of analysis much of the increase in cross-border lending in those two sub-regions reflects increased access to direct external funding by the corporate sector. Cross-border lending to banks also grew, especially in the Latin American region, but more

moderately. In contrast, in the Caribbean (and also in Asia) most of the cross-border bank lending has been intermediated by banks (the latter totalled around $285 billion or about 83% of total cross-border loans) by the end of 2007.

In this setting, Central and Latin America are more exposed to cross-border bank lending shocks to the corporate sector. As explained above, the impact could be particularly severe in the presence of currency mismatches in the corporate sector, as happened in Chile during the early 1980s. As for the Caribbean, exposure to liquidity shocks is more likely, as cross-border interbank lending represents mainly short-term debt, which directly affects liquidity in the financial system (Moreno and von Kleist (2008)). For example, one aspect of the data worth highlighting is the Asian experience, which suggests that cross-border interbank lending can be reduced sharply during a period of crisis (Graph 14, left-hand panel). This also occurred in several Caribbean countries during the late 1990s (e.g. Trinidad and Tobago's bank-related share of cross-border to total lending went from more than 25% in 1995 to less than 10% in 1999). Nevertheless, the aggregate picture for the Caribbean is more benign than the Asian experience.[43] Overall, a factor that should be taken into account to reduce external vulnerabilities is the availability of foreign currency to cover short-term external debt.

The behaviour of international bank claims

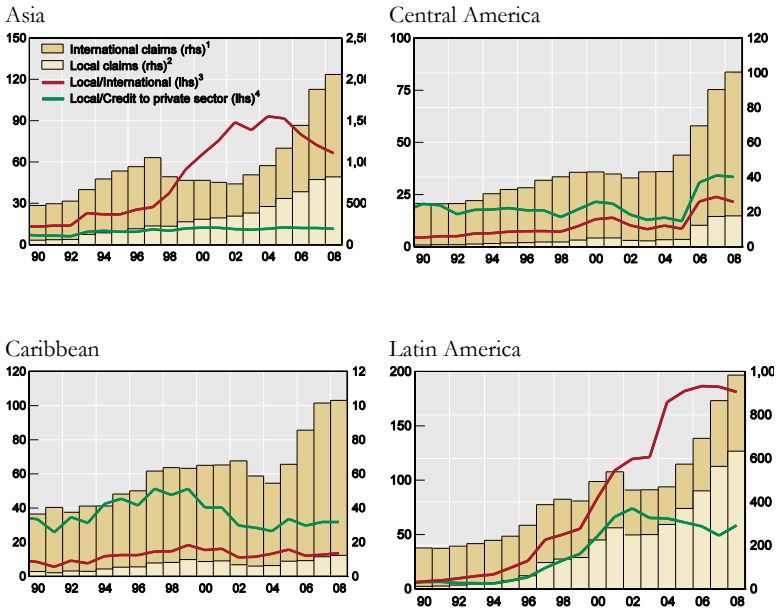
Foreign claims by BIS reporting banks can be classified as international and local, the latter being local currency assets of subsidiaries or branches of foreign banks in the domestic market. Graph 15 shows international and local claims of BIS reporting banks, and the ratio of local and international claims in LAC. As shown, in recent years, local claims have become increasingly important, highlighting the growing presence of foreign banks in the emerging economies.[44] Also, banking flows to Latin America appear to have been unaffected by the Asian crisis.

[43] This can be explained by the fact that the regional dynamics is distorted by the behaviour of the series in the Netherlands Antilles.

[44] For an overview of the transformation of the banking system, see BIS (2007a).

Graph 14
Claims of BIS reporting banks

By residence of immediate borrower, in billions of US dollars



Asia includes China, Hong Kong SAR, India, Indonesia, Malaysia, Philippines, South Korea, Taiwan (China) and Thailand….1Cross-border claims in all currencies. 2Claims on local residents denominated in local currencies and booked by reporting banks' local affiliates. 3In percent. 4 In percent, domestic credit to private sector equals line 22 c+d of the IFS.

Source: BIS, Consolidated Banking statistics, IMF, International Financial Statistics.

In fact, international and local claims on Latin America grew steadily during the late 1990s. However, in 2002 international claims to Latin America fell by almost $50 billion. Local claims experienced a parallel decline, indicating a more severe contraction in reporting bank activity than is suggested by international data alone. Also, the ratio of local to foreign claims is higher in Latin America (and also in Asia). The pattern in Central America and the Caribbean is different, as claims by

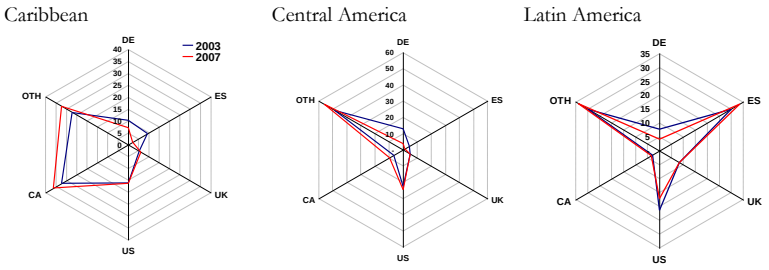
BIS reporting banks are mainly international claims. In 2007, the ratio of local claims to foreign claims was approximately 20% in Central America, 12% in the Caribbean, and 65% in Latin America.

In Latin America and Central America there has been a persistent increase in the ratio of local to foreign claims. From the financial stability point of view, this relative increase in local claims can be interpreted as beneficial since it involves credit in local rather than foreign currency, which could reduce currency mismatches (Moreno and von Kleist (2008)). In the Caribbean countries, the picture is quite different. In this sub-region, foreign bank activity is basically offshore, reflecting the role of this sub-region as a financial centre.

Creditor concentration and common lender effects

Graph 15
Consolidated foreign claims of reporting banks

As a percentage of total foreign claims[1]



1 Cross-border claims in all currencies plus claims on local residents denominated in local currency and booked by reporting banks' local affiliates.
DE=Germany, ES=Spain, UK=United Kingdom, US=United States, CA=Canada, OTH= Belgium, France, Italy, Japan, Netherlands, Sweden and Switzerland.

Source: BIS Consolidated Banking Statistics.

Financial contagion can arise from high creditor concentration and common lender effects (Rigobon (1999)). The reasons for the spillover could be associated with common lender needs to rebalance portfolios, or with the exposure to the country experiencing difficulties due to increased

risk aversion. This issue has been particularly important for LAC economies given that the penetration of foreign banks is above 40%.[45]

A way of evaluating the role of the main creditors to the region is through the use of the consolidated cross-border bank lending data compiled by the BIS. This measure compares the shares of total claims to LAC economies by major creditors. Graph 16 reports the main creditor countries for the LAC region: the United Kingdom (UK), the United States (US), Germany (DE), Canada (CA), Spain (ES), and others (OTH). It shows that Spain concentrates about 36% of total bank claims to Latin America (right-hand panel), but is less relevant in the Caribbean and Central America. The opposite occurs with Canadian banks, which have significant claims on a number of Caribbean economies (left-hand panel), but are relatively less relevant in Central America and Latin America. US banks have around 15-20% of total foreign claims in each sub-region, and show a slight decrease in recent years as foreign lender country in Latin America.

The importance of a common lender for EMEs can be evaluated with an index developed by Van Rijckehem and Weder (2001). This index measures the extent to which country *i* competes for funding from the same common lenders (*K*), as country *j*. The index has two terms (Eq. 4), the first one captures the relative importance of the common lender for both countries *i* and *j*. The second term measures the similarity in borrowing patterns that both countries have in relation with the common lender.

The index lies between 0 and 1, with a value of 1 indicating countries that share the same set of common creditors.

$$\text{Common lender}_i = \sum_K \frac{B_{iK} + B_{jK}}{B_i + B_j} \times \left\{ 1 - \left[\frac{\left| \frac{B_{iK}}{B_i} - \frac{B_{jK}}{B_j} \right|}{\frac{B_{iK}}{B_i} + \frac{B_{jK}}{B_j}} \right] \right\}, \ \forall\, i \neq j \qquad \text{(Eq. 4)}$$

[45] See Graph 17 which shows the presence of foreign banks in the local sub-regional banking sectors measured by the ratio of local claims of BIS reporting banks to domestic bank credit.

Table 3 reports a measure of the extent of fund competition in the LAC region in which emerging market economies have common lenders.[46] For each country, the average index of similarity with each sub-region is shown. Pairs of countries with a common lender index above a certain threshold are identified (P*=0.75). An index value above 0.75 may suggests potential vulnerabilities associated with common lender effects. There are a number of examples of this in Latin American economies. Argentina, for example, has a bilateral index above 0.75 with three countries (Colombia, Mexico and Uruguay), while Brazil has a bilateral index above this threshold with Paraguay and Uruguay. Central America and the Caribbean show a relatively low index of credit linkage, with the exception of Barbados.

5.0 Concluding remarks

This paper reviewed trends in capital flows in Latin America and the Caribbean between 2003 and mid-2008 and its implications for monetary policy as well as for financial stability. We showed that this cycle of capital flows can be characterised by five broad features: i) large gross FDI and portfolio inflows, both in terms of dollars and as a percentage of GDP; ii) incipient gross capital outflows in several countries; iii) a reduced reliance on external financing in net terms; iv) a reduction of external liabilities positions; and, finally v) improved net international positions.

[46] Creditor countries (K) are Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, United Kingdom, and United States, while i and j represent all emerging market economies.

Table 3
Common lender index – 2007 Q2

	Caribbean	Central America	Latin America	Countries above P*
Caribbean				
Aruba	0.53	0.28	0.36	BB
Bahamas	0.40	0.36	0.36	BZ
Barbados	0.62	0.55	0.80	AW, BO, BZ, CR, DO, EC, HN, HT, JM, JO, LB, LY, NI, OM, PY, SV, SY, TT
Dominican Republic	0.57	0.49	0.50	BB
Haiti	0.59	0.51	0.28	BB
Jamaica	0.54	0.30	0.26	BB
Netherlands Antilles	0.34	0.27	0.38	
Trinidad and Tobago	0.57	0.32	0.30	BB
Central America				
Belize	0.86	0.31	0.29	BB, BS,
Costa Rica	0.59	0.47	0.38	BB,SV
El Salvador	0.49	0.51	0.32	BB,CR
Guatemala	0.34	0.47	0.30	NI
Honduras	0.37	0.42	0.26	BB
Nicaragua	0.58	0.44	0.26	BB,GT
Panama	0.35	0.27	0.41	TH
Latin America				
Argentina	0.39	0.36	0.72	CO, MX, UY
Bolivia	0.79	0.28	0.61	BB
Brazil	0.38	0.32	0.64	PY, UY
Chile	0.28	0.21	0.66	MX, PE, VE
Colombia	0.33	0.34	0.70	AR, MX
Ecuador	0.46	0.51	0.55	BB
Mexico	0.31	0.32	0.69	AR, CL, CO
Paraguay	0.44	0.34	0.68	BB, BR
Peru	0.41	0.30	0.62	CL
Uruguay	0.40	0.33	0.67	AR, BR
Venezuela	0.25	0.20	0.63	CL

P*= 0.75.
Source: BIS, consolidated banking statistics.

These features suggest that capital flows were more benign than in the past. The shift in composition of inflows towards FDI suggests a greater resilience to reversals in capital inflows, because these inflows are relatively more permanent as they tend to be driven mainly by changes in economic fundamentals, rather than by arbitrage factors. In this sense, FDI inflows do not pose major monetary or financial stability concerns, as appreciation driven by FDI inflows could reflect an equilibrium response to better fundamentals. Several factors also contributed to reduce vulnerabilities to a reversal of capital flows. The decreased external liabilities together with the increased external asset position have improved the net balance sheet of Latin America. In addition, external financing needs declined for those countries with current account surpluses, and those countries with a rapid development of their local currency bond markets (BIS (2008a)) also saw a reduction in their external debt.

The trade-offs that capital flows pose for monetary policy and financial stability have also been analysed. Regarding monetary policy, we showed that LAC economies continued to manage the tri-lemma in very different manners, reflecting very diverse economic and financial structures across the region. Certainly, in each case the institutional arrangement has strengths and weaknesses. We also highlighted that complementary policies outside the realm of monetary policy may be desirable. In addition, we recognised that changing trends in gross inflows and outflows have different implications for financial stability throughout the changes in risk exposures (a distinction that is less relevant for monetary policy). We examined the degree of vulnerabilities of LAC economies to different sources of risks (exchange rate, liquidity, credit risk and contagion).

Overall, we found a significant decline of vulnerabilities in LAC thus confirming the view that the region is more resilient and better placed to confront adverse financial external shocks today than in the past. Certainly, as the global crisis in several major advanced economies continues to unfold and as the expected economic downturn begins to

materialise, it is likely that new vulnerabilities may surface. We leave the examination of the new developments for future research.

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