

External Shocks: How can regional financial institutions help to reduce the volatility of Latin American economies?

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Introduction

The dynamics of business cycles and GDP growth in Latin American countries have been highly influenced by external shocks. Capital flows had been the most important of these factors during the 1990s and the first years of the new millennium. However, since 2003, terms-of-trade shocks have once again become a major factor in explaining GDP growth. Despite improvements in domestic vulnerability indicators and in macroeconomic management and performance, the economies of the region are still vulnerable to these shocks and especially to sudden stops in capital inflows.

Regional financial vulnerability is heightened by the lack of suitable mechanisms to provide emergency financing to countries facing sudden balance-of-payments difficulties as a consequence of external shocks. Moreover, the absence of a security market to hedge and insure against such shocks magnifies their effects.

Without downplaying the importance of domestic factors, it should be noted that since the 1997 Asian crisis there has been a growing consensus that inefficiencies in international financial markets often exacerbate financial volatility, which, in turn, amplifies or generates domestic disequilibria.

This has led to a policy of self-insurance based mainly on the accumulation of international reserves, which is not always a very efficient option. Looking for more efficient ways to reduce vulnerability, we examine the role that financial regional institutions could play in overcoming these problems in the Latin American context. Regional agreements should be thought of as complements rather than as substitutes of global arrangements. First, we explore the possibility of expanding the Latin American Reserve Fund (FLAR) for emergency lending and, second, the need to push for the development of financial markets for State contingency securities.

The ability of a fund to address external shocks depends on the probability of negative events being correlated. A first glance at a correlation analysis for 10 Latin American economies indicates that expanding FLAR's regional coverage seems feasible. Even though the region faces common financial shocks and there is evidence of regional contagion, correlation coefficients for detrended series of international reserves tend to be low and non-significant; terms-of-trade correlations do not show a clear pattern either, and private capital inflows show positive correlations but generally not close to unity. In addition, a regional fund could help to curb mechanisms of crisis transmission between countries. Pooling reserves offers two possible benefits: access to increased reserve holdings, and a possible reduction in reserve volatility. The estimated coverage ratio, which combines both benefits, shows that low-volatility

countries tend to be worse off if they join a reserve pooling arrangement, while high-volatility countries will be better off. This implies that joining FLAR might involve incentive problems for countries with high reserves relative to their volatility.

Furthermore, in order to have a regional “lender of last resort”, and following the suggestions made by various authors, we propose that subregional development banks, together with FLAR, should complement the current efforts of the Inter-American Development and the World Bank in pushing for a market for State contingency bonds, such as CPI-indexed domestic-currency bonds, or GDP-indexed bonds. These institutions must promote the development of private markets, which has been hindered by coordination problems, lack of credibility, and problems of transparency and surveillance.

Deepening financial integration requires higher degrees of macroeconomic coordination. The progress made in this area in Latin American countries has been very limited. One way to move on is through a soft form of coordination combined with information exchange and the creation of supranational forums for policy debate. A harder form of coordination would entail establishing goals for the convergence of a set of macroeconomic variables.

I. Growth Dynamics

In the last decade and a half, growth performance in Latin American economies has been disappointing. In 1980-2005, growth rates were quite modest, with an average of 2.2%, while for the same period other developing countries grew, on average, by more than 4.0%. (table 1). Growth rates were not only low but also highly volatile. Real volatility in the region has increased significantly since the 1980s, becoming, on average, four times as large as in the rest of the developing world (graph 1). The volatility of the business cycle has affected the average growth rate (higher volatility is usually associated with lower growth) and has hindered the expansion of the productive sector, since the uncertainty generated by volatility negatively affects investment and savings decisions.

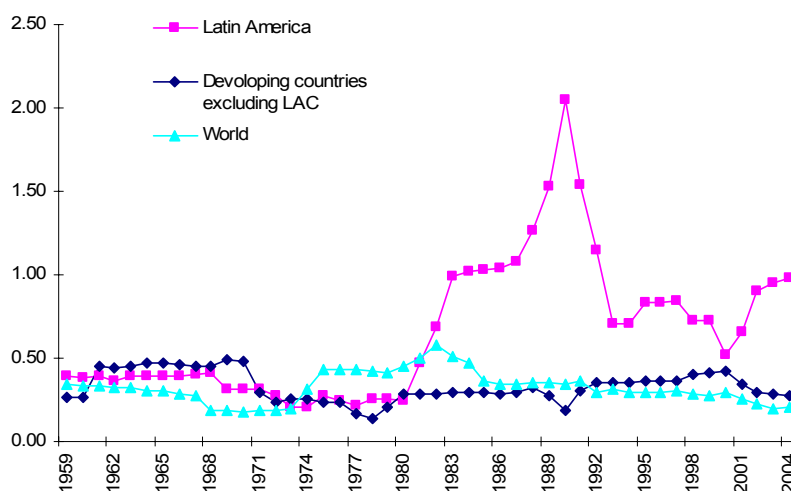
Table 1
ANNUAL GROWTH RATES, SELECTED PERIODS
(Average annual rates)

	Developed Economies	Developing Countries	Latin America (19)
1980-1990	3.1	3.3	1.1
1990-2005	2.4	4.7	2.8
1980-2005	2.6	4.2	2.5*

Source: ECLAC

* For Latin America the average is 1980-2006

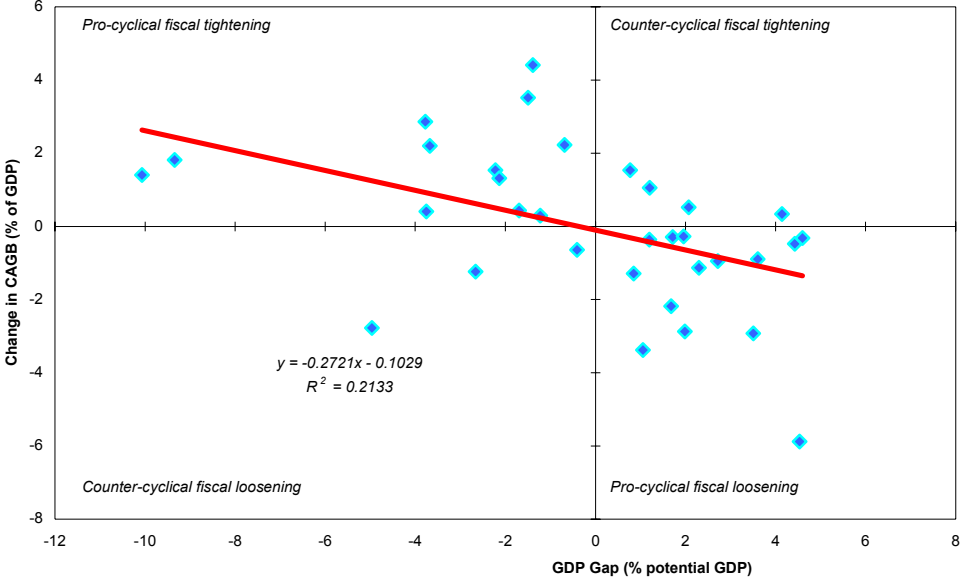
Graph 1
VOLATILITY OF GROWTH RATES
(Coefficients of variation, 10-year moving averages)



The reasons that lie behind the region’s poor and volatile growth performance have to do with both domestic and external factors. Within the former, attention should be devoted, among other things, to procyclical macroeconomic policies, low saving and investment rates, and shallow financial markets. Graph 2 illustrates the procyclical behaviour of fiscal policies in the region.

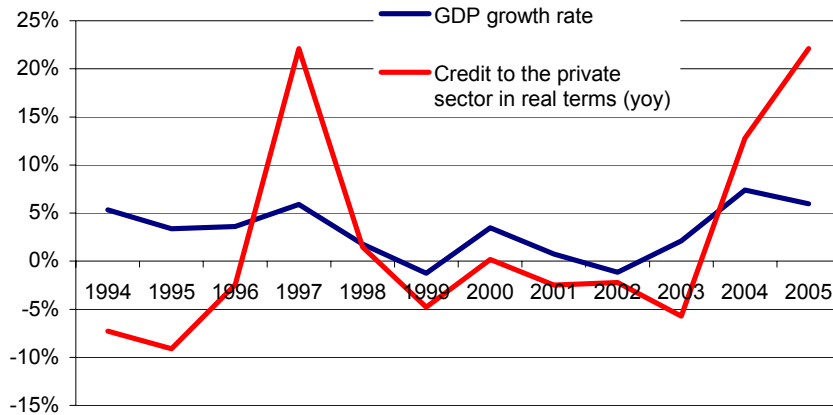
Domestic financial systems have also contributed to the pronounced volatility of business cycles. Financial markets, in the majority of the region’s countries, remain oriented towards the short term and consist mostly of banking operations, while the development of capital markets is very limited. They are still highly dollarized and credit rationing is prevalent. The expansion of financial activities has not translated into the development of instruments of financial intermediation that could help to increase liquidity and to smooth out economic activity. Financial markets have tended to accentuate business cycles, particularly those originating in external shocks. As can be seen from graph 3, domestic credit behaviour tends to magnify GDP fluctuations.

Graph 2
LATIN AMERICA: PROCYCLICALITY OF FISCAL POLICY
1990-2005



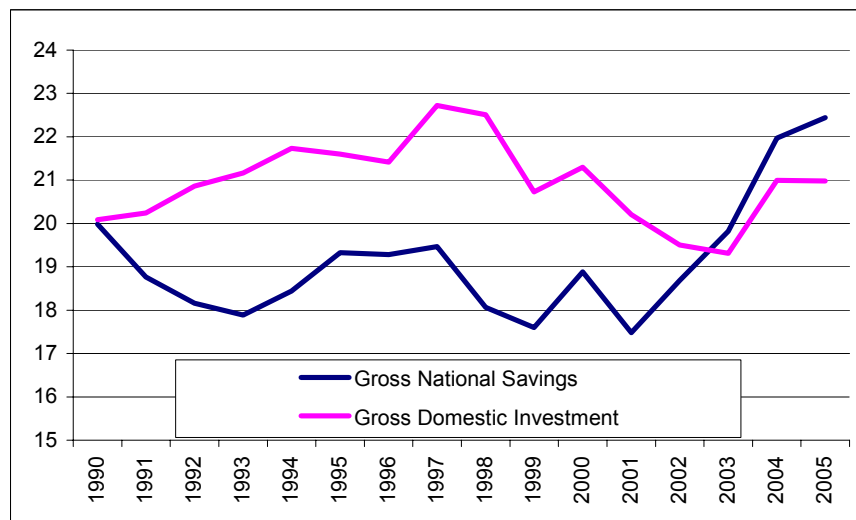
Source: Martner and Tronben (2006)

Graph 3
CREDIT TO THE PRIVATE SECTOR AND ECONOMIC ACTIVITY
(Average for 7 LAC countries)



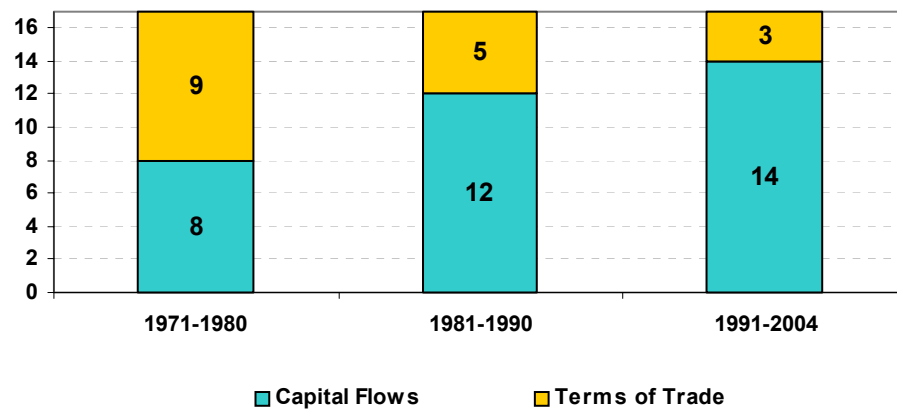
Saving and investment, two key ingredients for rapid and sustainable growth, do not have a good record in the region either. Economic volatility, together with underdeveloped financial markets, has had negative effects on these two variables, and especially on investment. For the period 1990-2005, investment and domestic savings have averaged 21% and 19% of GDP, respectively (graph 4). Total factor productivity in 1990-2002 rose, on average, by 0.6% (ECLAC 2004).

Graph 4
LAC SAVING AND INVESTMENT
(Percentages of GDP)



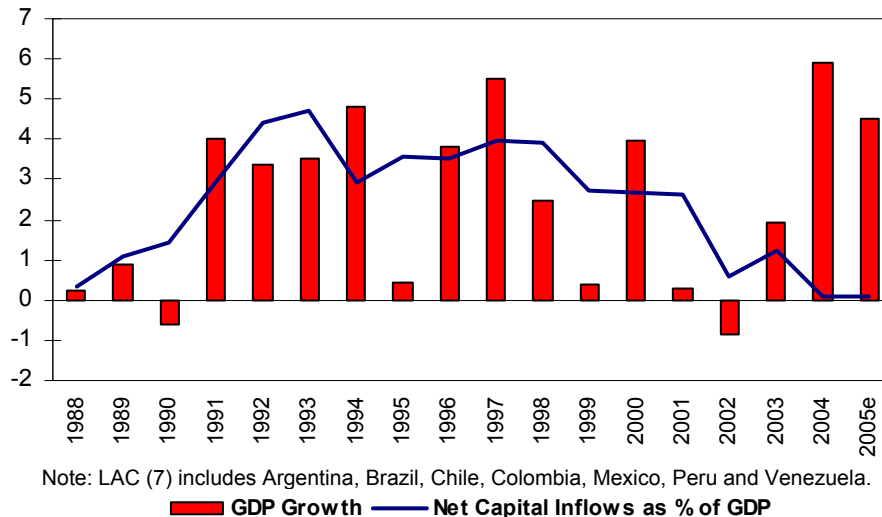
Apart from domestic factors, several analyses have shown that GDP volatility has been closely related to external shocks. For most countries, the importance of terms-of-trade shocks relative to capital-flow shocks decreased during the 1990s compared to previous decades (graph 5). This is a consequence of both the higher volatility associated with capital flows and less volatility in the terms of trade, with the latter being attributable to export diversification in most countries of the region during the last 20 years (ECLAC, 2004). Therefore, while the cyclical behaviour of trade and the terms of trade have continued to play a role, during the last decade the volatility of external financial flows has been a fundamental determinant of the business cycle (graph 6). Since 2003, however, GDP growth has become highly correlated with positive terms-of-trade shocks.

Graph 5
LAC (17): NUMBER OF COUNTRIES WITH BIGGER VOLATILITY OF EACH TYPE



Source: Lopez-Monti (2005, mimeo).

Graph 6
GDP GROWTH AND FINANCIAL FLOWS



II. Financial Vulnerability

World financial flows through the banking sector, bond and equity markets, and financial derivatives have expanded at high rates since the 1990s. This rapid financial development has been characterized by volatility and contagion. In spite of macroeconomic and institutional reforms at domestic and international levels, these phenomena persist, and capital flows to Latin America, as to other developing regions, remain volatile (Ocampo and Martin, 2003).

As shown in table 2, the sharp fluctuations in capital inflows since 1990 have primarily reflected the behaviour of debt and portfolio investment. FDI, on the other hand, followed a clear upward trend that remained unbroken until the international crisis of 2001 and 2002. Migrant worker remittances have been increasing and had come to represent around 2% of the region's GDP by 2005.

Table 2
LATIN AMERICA AND THE CARIBBEAN: SOURCES OF EXTERNAL FINANCING, 1990-2005
(Percentages of GDP)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
A. Debt	0.7	1.4	2.9	2.7	0.7	2.1	0.9	0.7	1.4	-1.1	-0.9	-0.8	-1.3	-0.7	-1.9	-2.1
Loans ^a	-0.1	0.6	0.9	-1.2	-2.2	2.3	-0.7	0.0	-0.2	-1.9	-0.9	-0.5	-0.6	-0.6	-1.3	-1.9
Bonds	0.8	0.8	2.0	3.9	2.9	-0.1	1.5	0.8	1.6	0.8	0.0	-0.3	-0.7	-0.1	-0.6	-0.2
B. Investment	0.8	1.6	1.6	2.3	2.6	1.8	2.9	3.5	2.9	4.0	3.4	3.6	2.7	2.0	2.2	2.3
Direct	0.6	1.0	1.0	0.8	1.5	1.5	2.2	2.9	3.2	4.5	3.5	3.4	2.6	1.9	2.2	2.0
Equity	0.2	0.6	0.6	1.5	1.0	0.3	0.6	0.6	-0.3	-0.5	-0.1	0.1	0.1	0.1	0.0	0.3
C. Other ^a	-0.1	0.1	0.0	-0.2	-0.3	-0.3	-0.1	-0.2	-0.3	-0.2	0.2	-0.5	-0.7	-0.2	-0.2	-0.1
D. Worker remittances	1.0	1.0	1.1	0.9	0.9	1.0	0.9	0.9	1.0	1.2	1.1	1.4	1.8	2.1	2.1	2.0
Total (A+B+C+D)	2.4	4.0	5.6	5.8	3.9	4.7	4.5	4.9	4.9	4.0	3.9	3.7	2.5	3.2	2.1	2.0
Total excluding remittances	1.5	3.0	4.5	4.8	3.0	3.7	3.6	4.1	4.0	2.8	2.8	2.3	0.7	1.1	0.1	0.1

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the International Monetary Fund (IMF).

^a Includes the Capital Account plus Errors and Omissions

Note: GDP in current dollars was used in these calculations.

Although variations in capital flows are usually measured in terms of GDP, their impact on economic activity depends upon what kind of effect they have on the current account. For example, a simplified model will show us that the impact on the level of economic activity of a decrease in capital flows equivalent to two points of GDP will depend on how much of a decrease in imports is necessary to offset the decline in financing. If imports are equivalent to 10% of GDP and exports to 8%, then a decrease in financing equivalent to 2% of GDP will result in a 20% drop in imports. Assuming a GDP elasticity of imports of 2, in the short run the level of economic activity ought to fall by 10%. The greater the degree of openness, the smaller the impact will be (Calvo, Izquierdo and Talvi, 2003). For example, if imports represent 20% of GDP, then a drop in external purchases equivalent to 2% of GDP will bring about a 5% reduction in output.

The above exercise is a simplified description, however. First of all, the adjustment will be made not only through the absorption effect but also through a change in relative prices, although the latter will be relatively smaller in the short run. In addition, in the short term the size of the adjustment can be scaled down by drawing down international reserves. The main point here, however, is that the magnitude

of the adjustment in GDP will depend on the impact that the decrease in capital flows has on the current account. Moreover, the less open the economy is, the greater the impact will be.

These indicators show us not only that the region is facing greater capital-flow volatility, but also that the magnitude of such flows' impact is considerably greater than in the developed world or other developing regions.¹

In any case, it is interesting to note that standard vulnerability indicators have improved significantly in the region.² All indicators related to short-term liquidity requirements have changed for the better, and the ratio of short-term debt to international reserves has declined substantially; also, the ratio of total external debt to exports has dropped.³ However, several countries still show balance sheet problems, mainly related to currency mismatches in the financial structures of firms, financial institutions, and the public sector, even though the public debt-to-GDP ratio has declined, with differences across countries, and the issuing of public debt in domestic currency at fixed rates has increased (graph 7).

Moreover, the growing importance of bond markets as a source of financing has turned sovereign risk into an important indicator of an economy's perceived vulnerability. The country risk premium reflects the probability of non-fulfilment of debt commitments. Since the Argentine crisis, risk premiums have, on average, moved downward, reflecting a more positive appraisal of the region's economies by international financial markets. It is worth noting that risk premiums reflect not only domestic conditions, but also worldwide liquidity and problems of contagion and herd behaviour. A comparison of the sovereign risk of countries in the region will reveal the same tendency. The Asian crisis in 1997 and the Russian moratorium in 1998 both resulted in an increase in country risk premiums for most emerging countries. Clearly, the amount of the increase is not the same, given the specific conditions prevailing in the different countries (graph 8).

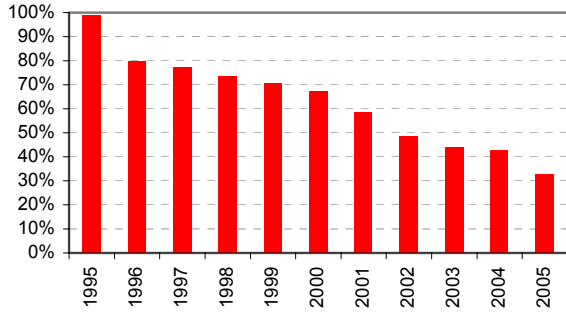
¹ Measured in terms of their impact on the current account, capital flows exhibit a magnitude four and three times greater in MERCOSUR and in the Andean Community, respectively, than in the European Union. The difference is somewhat less but still considerable in the case of ASEAN (José Luis Machinea, 2003).

² See ECLAC, 2006.

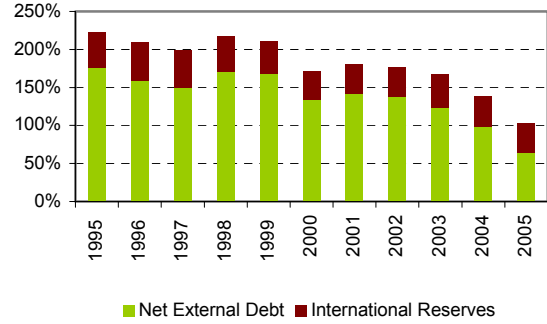
³ The pattern of these indicators in the region is similar to that observed among developing countries in other regions. In practically all the emerging economies, there has been, on average, a fall in short-term debt and an improvement in the ratio of short-term external debt to reserves

Graph 7 VULNERABILITY INDICATORS

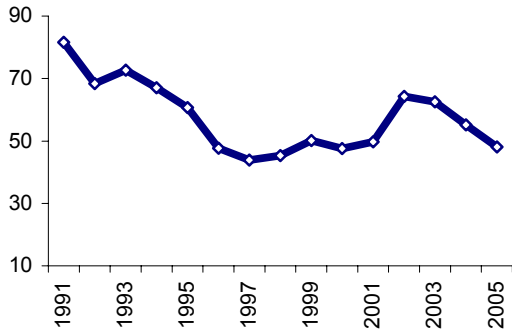
Short-term external debt / international reserves



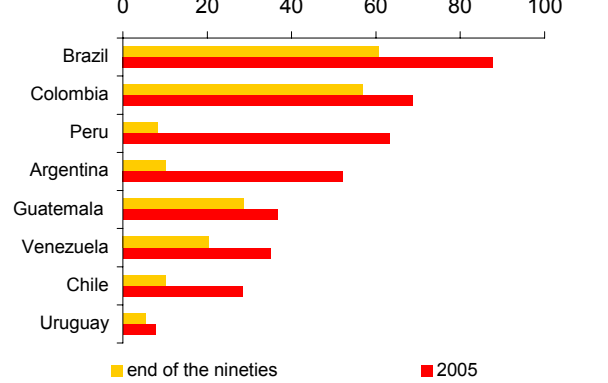
Total external debt/ exports



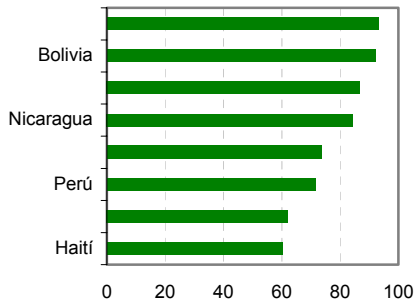
Public debt / GDP



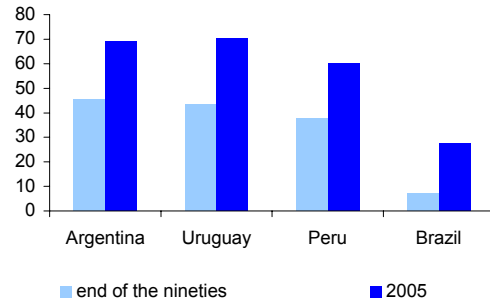
Public debt in domestic currency / total public debt



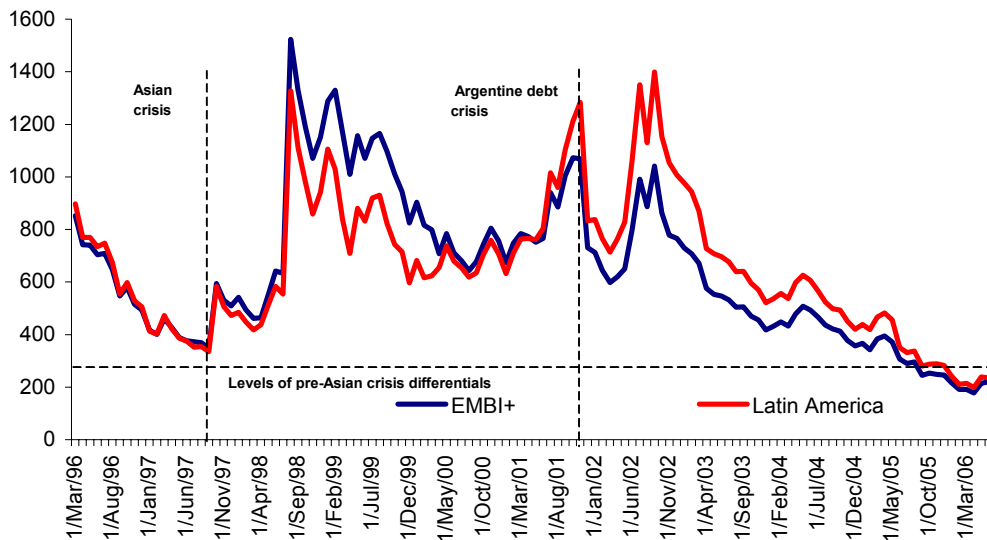
Dollarization of deposits (2005)



Fixed-rate public debt / total



**Graph 8
COUNTRY RISK PREMIUMS**



Despite the improvements in domestic vulnerability indicators and in macroeconomic management and performance, the volatility observed in growth behaviour suggests that the economies of the region are still vulnerable to external shocks, especially to sudden stops in capital inflows. Without seeking to minimize the importance of domestic factors, it should be noted that since the 1997 Asian crisis, there has been a growing consensus that inefficiencies in international financial markets often exacerbate financial volatility, which, in turn, amplifies domestic disequilibria. In fact, the recent waves of financial crises have prompted numerous proposals for reforming global financial markets and institutions (Ocampo, 2002a; Caballero, 2003; Calvo, 2005).

To protect against the risk of capital flows reversal, the majority of Latin American countries have used stabilization funds and international reserves as self-insurance mechanisms. Holding international reserves as an insurance mechanism, has proven to be costly and inefficient since reserves bear lower returns than less liquid assets. Also, given the deficits in infrastructure and social needs, the opportunity cost of holding reserves can be quite high.

Global financial markets and institutions were not able to offer protection against capital-flows reversal by establishing suitable mechanisms for emergency lending to provide liquidity to countries facing balance-of-payments problems during the 1990s. These crises revealed shortcomings and delays in the provision of assistance by the International Monetary Fund to emerging economies, which were attributable only in part to the fact that resources and capacities were overwhelmed by the scale of the

events in question. Other reasons include the extensive discussions related to conditionality clauses and, in some cases, to the “wait and see” attitude adopted in regard to policy results. If this diagnosis is correct, regional and subregional funds that would act as “lenders of first resort” could be an effective complement to the role of the Fund as a lender of last resort (Mistry, 1999).

In addition, financial vulnerability in Latin American countries has been heightened by the absence of deep and liquid markets (both domestic and international), which has prevented the development of securities with better cyclical properties than foreign-currency-denominated bonds. Issuing securities such as GDP-linked bonds or bonds linked to the terms-of-trade has proven to be very difficult. Also, issuing debt denominated in domestic currency has been hard to implement. The lack of these instruments has increased financial volatility and this, in turn, has translated into business-cycle volatility. For instance, the devaluation of the exchange rate to cope with a negative external shock could have negative effects on the financial and real sector, and this impact would be even greater if the economy is highly dollarized.

The role that regional financial institutions can play in overcoming these problems has been underestimated when designing strategies to improve global financial arrangements. There are several arguments for more active participation by regional institutions. First, the contagion effects surrounding financial crises have important regional dimensions. Second, intraregional trade and investment flows have deepened because of regional agreements. Third, macroeconomic linkages have deepened, and domestic macroeconomic policies’ externalities for neighbouring countries have increased (Ocampo, 2006; Culpeper, 2006; Machinea and Rozenwurcel, 2006).

Since the 1997 Asian crisis, there has been a growing demand for regional financial cooperation to establish mechanisms to prevent the recurrence of financial crises. These demands focus on emergency lending, on the one hand, and on the development of more liquid and deeper financial markets, on the other. Recent examples are the Chiang Mai Initiative, launched in 2000, which involved the creation of a short-term liquidity facility via a network of bilateral currency swaps; and the 2003 Asian bond market initiative aimed at developing a full-fledged regional bond market.

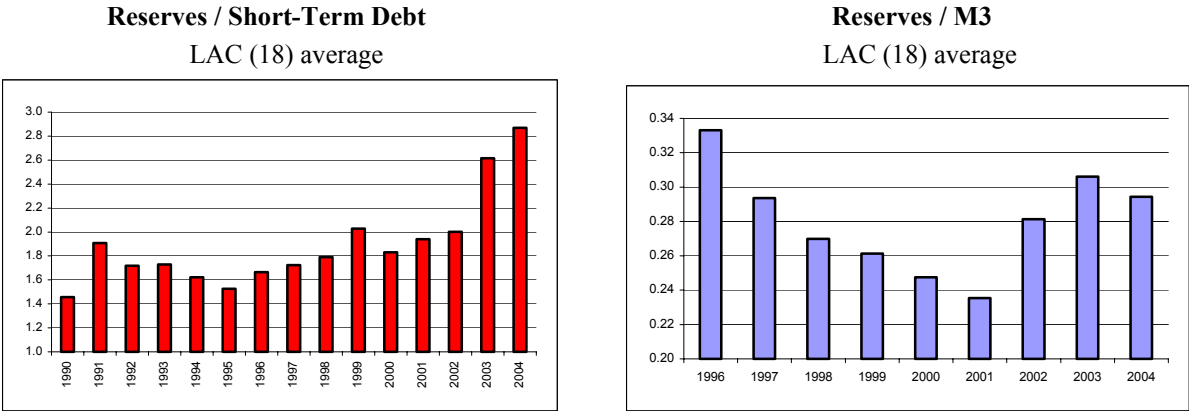
In the following discussion we will concentrate on exploring the role of existing regional financial institutions in Latin America in contributing to emergency financing and the development of financial instruments, as a way to stabilize financial flows to developing countries and reduce their vulnerability. We will focus on three issues: the role of the Latin American Reserve Fund (FLAR) in providing short-term financing to cope with balance-of-payments crises, the role that regional and subregional development banks and FLAR can play in supporting the development of financial markets, and the role of macroeconomic coordination.

Financial Integration in Latin America

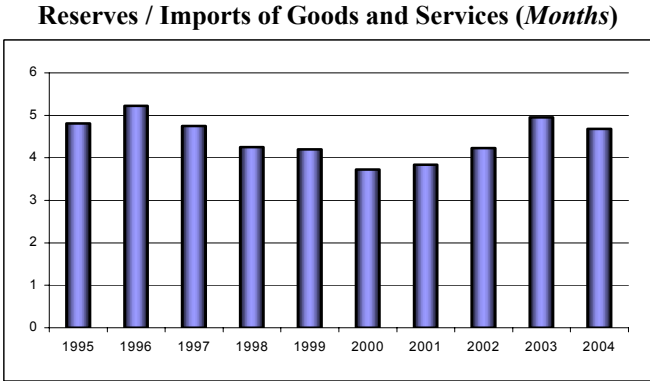
A. Reserve Pooling

Since the beginning of the 1990s, Latin American countries have been accumulating reserves (graph A.1 in the appendix). The underlying rationale for this has a great deal to do with the need to protect these economies from possible capital-flows reversal. This is reflected in the significant increase in the ratios of international reserves to short-term debt and to M3, which indicate the capacity of the economy to cope with sudden capital outflows. On the other hand, the reserve-import ratio does not show a significant increase, which suggests that countries are not accumulating reserves due to trade precautions (graph 9).

**Graph 9
RESERVE RATIOS**



Source: ECLAC, on the basis of *Global Development Finance* and *World Development Indicators*, World Bank.



Despite the existence of the Latin American Reserve Fund (FLAR), the majority of countries do not participate in this reserve pooling arrangement.⁴ FLAR was created in 1978 as the Andean Reserve Fund to serve the countries of the Andean Community, and it was not until 1991 that a new country (Costa Rica) joined the fund. FLAR operates as a credit cooperative in which the member countries' central banks are able to take out loans, in proportion to their capital contributions, through different credit facilities.⁵ The fund has three objectives: (i) to provide financial support for its member countries' balances of payments; (ii) to improve the terms for its member countries' reserves investments; and (iii) to help harmonize its member countries' monetary and financial policies.

FLAR has been quite successful in providing short-term financing to its member countries. Between its creation and the end of 2003, FLAR disbursed credits worth a total of US\$ 4.9 billion, consisting chiefly of credits for balance-of-payments support and liquidity credits. During the worst years of the 1982-1984 debt crisis, FLAR increased its resource contributions significantly. This was also done in the 1996 and 1998-1999 crises (table 3). During the period 1978-2003, FLAR contributed resources equivalent, on average, to 60% of the amount of IMF exceptional financing provided to the Andean Community countries (Titelman, 2006).⁶

An important feature of FLAR's financing is its speed and timeliness. Depending on the type of credit, loan approvals require the authorization of either the board of directors, which is made up of member countries' central banks, or else the chief executive officer. This arrangement has resulted in speedy and timely financing; giving FLAR an operational advantage over the IMF. This fact was not necessarily reflected in the amounts of resources provided, but rather in the relevance of the credits. The sense of ownership that countries feel towards FLAR is reflected in its preferred creditor status among its member countries have given to the fund. The countries' central banks must register any loans granted by FLAR as liabilities in their international reserves account, thereby providing an additional guarantee of repayment. FLAR's preferred creditor status is reflected in its present Moody's rating of Aa2 and its Standard & Poor's rating of A+.

⁴ Currently includes the Bolivarian Republic of Venezuela, Bolivia, Colombia, Costa Rica, Ecuador and Peru

⁵ (i) Credits for balance-of-payments support are issued for a three-year term, with a one-year grace period, capped at 2.5 times the paid-up capital (except for Ecuador and Bolivia, where it is 3.5 times the paid-up capital), and their approval requires the consent of the board of directors; (ii) Credits for restructuring the external national debt are issued for a three-year term, with a one-year grace period, capped at 1.5 times the paid-up capital, and their approval requires the consent of the board of directors; (iii) Liquidity credits are issued for a term of up to one year, capped at 1.0 times the paid-up capital, and their approval requires the authorization of the chief executive officer; (iv) standby credits are issued for a term of up to six months, capped at 2.0 times the paid-up capital, and their approval requires the authorization of the chief executive officer; (vi) treasury credits (repos) are issued for a term of from one to thirty days, capped at 2.0 times the paid-up capital and 50% collateralized, and their approval requires the authorization of the chief executive officer.

Table 3
FAR/FLAR DISBURSEMENTS AND IMF EXCEPTIONAL FINANCING
(Millions of dollars)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
FAR/FLAR disbursements																											
Total (1)	15	18	39	53	158	364	686	284	440	291	251	390	390	451	20			234	34		494	125				156	
Bolivia			39	53	53	53	30	165	190		28	96	121	48	20												
Colombia						50	529	85														125					
Ecuador					105	67	127	34	250		93	54	117					234	34		494						
Costa Rica																										156	
Peru	15	18				195				20	130	240	129	403													
Venezuela (Bolivarian Rep. of)										271			23														
IMF exceptional financing																											
Total (2)	145	267	261	62	358	532	147	121	224	49	169	1 052	1 906	449	57	897	186	26	557	244	46	23	165	72	98		
Bolivia	38	11	96		27	19			135		91	58	31	31	51		44	26	49	23	46	23	15	24			
Ecuador						218	40	86	89	49	78	20	32	25			142						150	48	98		
Costa Rica		27	20	62		119		35					76	6													
Peru	107	229	145		331	176	107									897				221							
Venezuela (Bolivarian Rep. of)												974	1 843	317					508								
(1)/(2)	0.1	0.1	0.1	0.9	0.4	0.7	4.7	2.3	2.0	5.9	1.5	0.4	0.2	1.0	0.4	▼	▼	9.0	0.1	▼	10.7	5.4	▼	▼	▼		

Source: Titelman 2006.

1. FAR/FLAR contingency financing is not broken down by country because it is zero for every year. The same applies to disbursements, as a result of debt restructurings, except for 1995 and 2003, when funds worth US\$ 200 million and US\$ 156 million were disbursed to Ecuador and Costa Rica, respectively. FAR/FLAR disbursements given by country do not include countries that had zero disbursements, for whatever reason, throughout the period 1978-2004.
2. IMF disbursements do not include the reserve tranche.
3. The FAR/FLAR accounting year runs from July to June, whereas the IMF uses calendar years.

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One of the benefits for countries that join a reserve pool is that they gain access to increased reserve holdings. When their debt capacity with FLAR is added to the member countries' international reserves, the short-term debt/international reserves ratio drops significantly in some cases (Bolivia, Ecuador and Costa Rica) (table 4)

Table 4
IMPACT OF FAR/FLAR ON FINANCIAL VULNERABILITY
(SHORT-TERM DEBT/ INTERNATIONAL RESERVES)

(March 2003)

	Bolivia	Colombia	Costa Rica	Ecuador	Peru	Venezuela (Bolivarian Rep. of)
Subscribed capital	234	469	234	234	469	469
Paid-up capital	157	313	133	157	313	313
IMF quotas	233	1 053	222	414	878	3 721
Short-term debt	370	3 800	1 499	2 316	2 335	3 720
International reserves	893	10 844	1 497	1 004	9 721	12 107
Short-term debt/international reserves (%)	41	35	100	231	24	31
Short-term debt/increased international reserves (%) ^a	26	33	82	149	22	29

Source: Prepared by the author, on the basis of data from the countries, the Latin American Reserve Fund (FLAR) and the International Monetary Fund (IMF).

^a The quotient of short-term debt over increased international reserves is calculated by adding to international reserves the debt capacity in FAR/FLAR, which is equal to 2.5 times the paid-up capital, except for Bolivia and Ecuador, where it is 3.5 times.

The fact that FLAR has played a quite successful role in providing short-term balance-of-payments financing to its member countries raises the question as to the feasibility of expanding the membership of FLAR. A first element to consider relates to the correlation of external shocks across countries. If most contributing countries need to draw on the fund simultaneously because they experience shocks at the same time, then the advantages of reserve pooling disappear. However, even in the presence of high correlations, reserve pooling could still be feasible if shocks affect different countries with different intensities, since this would allow some of the reserves of countries experiencing lower effects to be lent to countries suffering more severe effects. Furthermore, lending at the onset of a liquidity squeeze could avoid a crisis in a given country and thus avert the contagion of others, thereby reducing the correlation produced by the "contagion effect". The fund's capacity to borrow from financial markets will also help to overcome correlated shocks. Be this as it may, high positive correlation coefficients do tend to weaken the argument for a reserve pool.

We use correlation coefficients across a sample of 10 countries to obtain a first simple approximation to some of these issues. To the actual FLAR countries (Bolivia, Colombia, Costa Rica, Ecuador, Peru, and Venezuela), we have added Argentina, Brazil, Chile, and Mexico. We estimated correlations between international reserves, private capital inflows, and terms of trade for the period 1990-2005. The results are summarized in table A.1 of the appendix.

Correlation coefficients between the countries' stocks of international reserves are significant (at a 5% level) in 32 out of 45 cases and tend to be quite high. These coefficients may, however, be magnified by the fact that, as previously mentioned, all countries in the sample show an upward trend in reserve accumulation during the period considered (see the graphs in appendix 2). To tackle this issue we detrended the series using the Hodrick-Prescott filter. Correlation coefficients dropped significantly for most countries, and some coefficients lost significance (only 17 out of 45 were significant at the 5% level). When the exercise is done using annual changes in international reserves, correlations tend to be low and non-significant.

For the terms of trade, correlation coefficients do not show a clear pattern. There is a mixture of negative and positive coefficients of smaller and bigger magnitude, with only 15 of the 45 coefficients being positive and significant. This is not a surprising result since, when one looks at the recent evolution of terms of trade among Latin American countries, the trends have been mixed. For Central American countries, the terms of trade have declined (12% on average between the 1990s and 2005), while for South American countries they rose in the same period (31% on average). Moreover, the positive South American average includes some countries for which the terms of trade worsened. Along these same lines, Machinea (2003) has found that Latin American countries do not show, on average, a high correlation for their terms of trade in comparison with that of Europe.

For private capital inflows, the results are similar to those obtained for the terms of trade, with no clear patterns emerging. Positive correlations are generally not close to unity, with most being small and not significant. The negative correlations are, in general, not significant. These results coincide with those reported by Urrutia (2005) and Agosin (2000) for a different sample of Latin American countries. In the same vein, Machinea (2003) obtained coefficients for MERCOSUR countries that are mostly positive but small and sometimes not significant.

The results suggest that expanding the number of countries joining FLAR seems feasible and that countries will probably not experience financial shocks of the same severity. In addition, a regional fund could help to curb mechanisms of crisis transmission between countries.⁷

Pooling reserves offers participant countries two possible benefits: access to increased reserve holdings, and a possible reduction in reserve volatility. Countries for which the level of reserves is low relative to their volatility will benefit from pooling reserves with countries that have a higher level of reserves relative to their volatility. Of course, the opposite is also true. To estimate which countries would lose or win by joining FLAR, we have closely followed Williams et. al (2001) and Eichengreen (2006).

Equation 1 defines coverage for country *i* as the ratio of reserve holdings to their variability. Coverage will increase if there is an increase in international reserves or a decrease in reserve volatility:

$$C_i = \frac{R_i}{Var(R_i)} \quad (1)$$

Where R_i is the average level of reserves during a given time period and $VAR(R_i)$ is their variability during the same time period. When a country joins the reserve pool, it will gain access to higher reserve holdings but it will also be affected by the volatility in other countries' reserves. Country *i* will benefit from pooling if the variability of the pool is lower than that of its individual reserves, or if the increased access to reserves outweighs the higher variability of the pool. The coverage ratio for country *i* becomes:

$$C_i = \frac{(R_i + \sum_{j \neq i} \rho R_j)}{Var(R_i + \sum_{j \neq i} \rho R_j)} \quad (2)$$

Where ρ is the degree of pooling $0 < \rho < 1$ and R_i is the total reserves of country *i*. and R_j is country *j*'s reserves. That is, with partial pooling, country *i*'s total access to reserves equals all its own reserves plus the partially pooled reserves of all other members of the pool when $\rho=0$ equation (1) and (2) are the same.

⁷ Agosin (2000) calculates that if a reserve fund were endowed with 15% of the reserves of the 11 countries of the region (including all the large countries except Mexico), it could provide financing to cope with capital outflows equivalent to the entire short-term foreign debt of all the countries under the arrangement.

Table 5 shows the mean, standard deviation and volatility coefficient of the international reserves for the 10 countries analysed for the period 1990-2005. These volatility coefficients range from 0.56 for Mexico to 0.19 for Chile. Table 6 summarizes the coverage ratios calculated using equation 2 for different values of ρ . Colombia and Chile lose when joining the reserve pool, since they experience a decline in effective reserves compared to self-insurance. These two countries show the lowest international-reserve volatility coefficients for this period. The rest of the countries improve their situation with pooling. Mexico is the one that gains the most, followed by Ecuador and Peru. These three countries are the ones that have the highest volatility coefficients. These results imply that expanding the membership of FLAR is not straightforward, and that there might be incentive problems for countries with high reserves relative to their volatility if they were to join the fund.

Table 5
RESERVE VARIABILITY, 1990-2005

	mean	SD	Var. Coeff.
BOLIVIA	1226	447	0.36
COLOMBIA	9916	2443	0.25
COSTA RICA	1478	479	0.32
ECUADOR	1634	656	0.40
PERU	9109	3480	0.38
VENEZUELA	16034	5277	0.33
ARGENTINA	18597	6445	0.35
BRAZIL	43106	14342	0.33
CHILE	14832	2829	0.19
MEXICO	35425	19825	0.56

Note: The measure of volatility used was the variation coefficient (the ratio of the standard deviation to the mean).

Table 6
COVERAGE RATIOS, 1990-2005

	p=0	p=0.1	p=0.2	p=0.3	p=0.4	p=0.5	p=0.6	p=0.7	p=0.8	p=0.9	p=1
BOLIVIA	2.74	3.38	3.41	3.41	3.42	3.42	3.42	3.42	3.42	3.42	3.42
COLOMBIA	4.06	3.69	3.57	3.52	3.49	3.47	3.45	3.44	3.44	3.43	3.42
COSTA RICA	3.09	3.44	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.42
ECUADOR	2.49	3.38	3.41	3.41	3.42	3.42	3.42	3.42	3.42	3.42	3.42
PERU	2.62	3.12	3.25	3.32	3.35	3.37	3.39	3.40	3.41	3.42	3.42
VENEZUELA	3.04	3.38	3.44	3.45	3.45	3.44	3.44	3.44	3.43	3.43	3.42
ARGENTINA	2.89	3.47	3.56	3.56	3.54	3.51	3.49	3.47	3.45	3.44	3.42
BRAZIL	3.01	3.29	3.43	3.49	3.51	3.50	3.49	3.48	3.46	3.44	3.42
CHILE	5.24	4.28	3.92	3.74	3.64	3.57	3.53	3.49	3.46	3.44	3.42
MEXICO	1.79	2.18	2.48	2.71	2.90	3.04	3.15	3.24	3.31	3.37	3.42

B. Financial Development

It is widely agreed that financial-market imperfections have obstructed the financial integration of Latin American economies into international markets (Ocampo and Martin, ECLAC 2000; Calvo 2002). The lack of suitable instruments to hedge and insure against the risk of sudden stops in capital flows has had quite significant economic costs.⁸ These costs not only reflect the negative effects of full-blown financial crises, but also the deep recessions that countries have had to undergo in order to adjust to an environment of volatile capital flows (Caballero 2003). This has given rise to numerous proposals to develop security markets that enhance the capacity of emerging markets to deal with capital-flows reversals.

In general, these proposals incorporate the idea of issuing State contingency bonds, which may include CPI-indexed domestic-currency bonds, GDP-indexed bonds (Borensztein and Mauro, 2004; Shiller and Griffith-Jones, 2005), and bonds indexed to the prices of one or more commodities (Caballero 2001). Given these types of securities' unattractiveness for private investors, the private development of deep and liquid markets for them has been very slow and difficult. Coordination problems, national policies' lack of credibility, and problems of transparency and surveillance are mentioned as factors impeding the development of these markets. Caballero (2003) argues that a need exists for the active involvement of international financial institutions as a facilitator for initiating these markets.

In the Latin American context, there are different regional actors that could play a complementary role in helping global financial institutions to promote financial development. One of them, as suggested by Eichengreen (2006), is FLAR itself. The author proposes that FLAR could issue medium-term notes denominated in local currency and indexed to domestic inflation, or to GDP, as a way of helping to build a customer base for local-currency bonds. In order to have the effect of helping to introduce a benchmark (risk-free) asset, such borrowing could not, however, exceed levels consistent with the maintenance of FLAR's current investment grade rating. This proposal would entail a new area of activity for FLAR which would require it to adapt its fiduciary responsibilities.

⁸ Calvo (2004) calculates the output cost of capital reversal at around 5% of GDP in the year that follows the onset of the event. Edward (2005) calculates smaller effects on the order of 1%-2% of GDP.

A second type of institution would be the Inter-American Development Bank (IDB).⁹ Many analysts have proposed that IDB should lend to Latin American countries in domestic currencies by issuing inflation-indexed local-currency securities. (Fernandez Arias, Cowan 2006; Eichengreen and Hausman 2005b). In the last two years, IDB has been promoting the issuance of domestic-currency securities in Brazil, Colombia, Chile, and Peru (table 7). The investor base has been domestic as well as international, and the securities are listed in both domestic and international markets, which contributes to the price discovery process by creating tension between the two markets. Also, the bonds add value to international capital markets by providing AAA risk-rated assets denominated in local currency to international investors, who can then allocate currency risk separately from credit risk. By issuing debt in local currency, IDB helps to improve the countries' balance sheets and contributes to domestic financial markets by introducing best practices, providing assets-diversification opportunities to domestic investors, and providing liquidity to the bond and swap markets.

Table 7
IDB ISSUES IN LATIN AMERICAN CURRENCIES

	Date of Issues	Currency	Amount	USD equiv.	Coupon	Maturity
Brazil	11-May-04	BRL	550 m	94 m	0	5 years
Brazil	14-Dec-04	BRL	200 m	73 m	IGPM+6.26%	5 years
Colombia	23-Jun-04	COP	120 bn	44 m	IPC+0.54% (issued at discount)	7 years, payable
Colombia	10-Mar-05	COP	168 bn	73 m	IPC+3.95%	7 years, payable
Chile	25-Aug-05	CLP	36.3 bn	65 m	2.15% in UF	5 years
Peru	19-May-06	PEN	65.2 m	20 m	6.09375%	2 years

Source: Eloy Garcia, Presentation at the Seminar on the Role of Regional Funds in Macroeconomic Stabilization, held in Lima, Peru, 17-18 July.

A third important actor could be the subregional development banks. Since the 1990s, these institutions have significantly increased the financial flows they direct to the different subregions. The Andean Development Corporation (CAF) contributes around 56% of the total resources approved by development banks for the Andean Community countries. CAF became the main source of multilateral financing for the Andean countries, attaining 68% of the total approved during 2002. The Central American Bank for Economic Integration (CABEI) has also increased its loans, albeit to a lesser extent and with more ups and downs. Compared with the

⁹ The World Bank could also play an important role, but for the purposes of this paper, it is considered to be a global institution.

World Bank and IDB, CABI has contributed an average of around 40% of the total financing approved by these institutions for the Central American countries, reaching a maximum of 57% in 2003. The Caribbean Development Bank (CDB) accounts for around 30% of total loans approved by multilateral development banks between 1992 and 2002 (table 8).

The subregional development banks have a much higher investment rating than their member countries (Moody's ratings of Aa2 for CAF, Aaa for CABI-, Baa1 for CDB). This gives them a solid base for complementing IDB efforts in providing highly rated innovative local-currency assets to international investors.

Table 8
LOANS APPROVED BY DEVELOPMENT BANKS, 1995-2004

(Millions of current dollars)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Andean Community countries										
Loans approved										
IDB+World Bank	2,133	1,924	1,392	2,996	2,558	2,152	1,917	1,559	4,124	2,329
CAF	2,258	2,314	2,900	2,673	2,182	2,323	3,198	3,290	3304	3503
Central American Common Market countries										
Loans approved										
IDB+World Bank	876	626	593	1,233	1,027	513	1,079	1,043	513	760
CABEI	358	569	532	932	336	330	572	680	681	800
CARICOM countries										
Loans approved										
IDB+World Bank	345	506	176	189	334	270	310	326	242	221
CDB	92	73	51	117	137	179	85	108	185	94

Source: Titelman 2006.

C. Macroeconomic Coordination

The expansion of regional financial cooperation through reserve pooling and the development of financial markets would facilitate and be facilitated by policy coordination between countries. At the same time, deepening financial integration creates needs and incentives for higher degrees of macroeconomic coordination.

As any insurance mechanism, reserve-pooling schemes may face moral hazard problems caused by the fact that capital-flows reversals can occur as a result not only of external factors but also of domestic policies. One way to face this problem is through surveillance and conditionality. Initiating a market for innovative securities such as GDP-indexed bonds and local-currency-denominated indexed assets also requires a great deal of transparency and public information in areas relating, for example, to the way GDP and inflation are estimated. In order for macroeconomic coordination to contribute to these objectives' achievement, initial steps should be taken towards the standardization of national statistics.

Unfortunately, the progress made in the area of macroeconomic cooperation and coordination in Latin America has so far been rather limited. Means of moving forward in this area include periodic meetings, exchange of information, standardization of statistics and the creation of supranational forums for policy debate. Although information exchange is a “soft” form of coordination that has no direct effect on macroeconomic performance, it does enable countries to become better acquainted, improve their understanding of each other’s specificities and circumstances, and achieve a common vision, which is far from being the case at present in Latin American integration processes (Machinea and Rozenwurcel 2006).

A harder form of coordination involves establishing goals for the convergence of a set of macroeconomic variables. Given the regional context, these targets should include the fiscal deficit, inflation, current account deficit and short-term debt. Some of these targets could be used in setting FLAR’s conditionality, if compliance with the agreed goals for convergence were required in order for requesting countries to receive assistance from the fund. The need to ensure that targets are feasible raises the question of how strict the rules should be. A certain degree of policy flexibility has to be maintained in order to deal with unexpected critical situations. Excessive flexibility, however, could undermine the credibility of the commitments undertaken (Machinea and Rozenwurcel 2006). However, the benefits of issuing securities with better cyclical properties, as already discussed, should constitute an incentive for macroeconomic discipline and policy coordination.

One of FLAR’s mandates is to promote macroeconomic coordination among its members. This means that countries must accept some loss of sovereignty and requires strong political will to back up such coordination efforts. This is particularly true for larger partners in the agreement, for which the loss of autonomy is more costly. When economic interdependence among the members of an integration agreement is highly asymmetrical, the larger partners have the responsibility to provide leadership in order to move the integration process forward.

Conclusions

The dynamics of business cycles and GDP growth have been heavily influenced by capital flows to the region during the 1990s and the first years of the new millennium. Since 2003, terms-of-trade shocks have become an important factor in explaining GDP growth. Despite improvements in domestic vulnerability indicators and in macroeconomic management and performance, the economies of the region are still vulnerable to external shocks, particularly sudden stops in capital inflows. Without overlooking the importance of domestic factors, it should be noted that since the 1997 Asian crisis there has been a growing consensus that inefficiencies in international financial markets often exacerbate financial volatility, which, in turn, amplifies domestic disequilibria.

Regional financial vulnerability is heightened, on the one hand, by a lack of suitable mechanisms at the international and regional levels to provide emergency financing to countries facing balance-of-payments difficulties and, on the other, by the absence of a security market with better cyclical properties than today's foreign-currency-denominated bonds.

We have argued that regional financial integration could help to reduce financial volatility at the regional level. Self-insurance through reserve accumulation has proven to be costly and inefficient. Even though it covers only a few countries, the Latin American Reserve Fund (FLAR) has been quite successful in providing short-term financing to its member countries. Since its creation, FLAR has contributed average resources equivalent to 60% of IMF exceptional financing to the Andean Community countries. An important feature of FLAR's financing is its speed and timeliness.

A first glance at the relevant correlation analyses indicates that expanding FLAR's regional coverage seems feasible. Even though the region faces common financial shocks and there is evidence of regional contagion, the correlation coefficients of detrended series of international reserves tend to be low and non-significant (only 17 out of 45 are significant at the 5% level). Terms-of-trade correlations do not show a clear pattern either. There is a mixture of negative and positive coefficients of smaller and bigger magnitudes, with only 15 of the 45 coefficients being positive and significant. These results are in line with the conclusions reached by Machinea (2003), who has found that Latin American countries do not have, on average, a high correlation for their terms of trade when compared to Europe. Private capital inflows show

positive correlations, but they are generally not close to unity. These results coincide with those reported by Urrutia (2005) and Agosin (2000) for a different sample of Latin American countries.

Pooling reserves offers participant countries two possible benefits: access to increased reserve holdings, and a possible reduction in reserve volatility. The estimated coverage ratios for 10 of the region's economies show that countries with low volatility in international reserves would be worse off if they were to join a reserve pooling arrangement, while the high-volatility countries would be better off. This implies that joining FLAR might involve incentive problems for countries with high reserves relative to their volatility.

The absence of security markets to hedge and insure against the risk of sudden stops in capital flows has heightened financial volatility. The private development of deep and liquid markets for these types of securities has been very slow and difficult due to coordination problems, national policies' lack of credibility, and problems of transparency and surveillance. We propose that subregional development banks, together with FLAR, should complement the current efforts of the Inter-American Development Bank and the World Bank to promote the creation of a market for State contingency bonds, such as CPI-indexed domestic-currency bonds, or GDP-indexed bonds. In the case of FLAR, this proposal would entail a new area of activity which would require it to adapt its fiduciary responsibilities.

Deepening financial integration creates needs and incentives for higher degrees of macroeconomic coordination. The progress made in this area in Latin America has so far been rather limited. One way to move forward in this area would be through a soft form of coordination combined with information exchange and the creation of supranational forums for policy debate, which would enable countries to become better acquainted and improve their understanding of each other. A harder form of coordination would entail establishing goals for the convergence of a set of macroeconomic variables. Given that one of FLAR's mandates is to promote macroeconomic coordination, the targets for convergence could be used in setting FLAR's conditionality, if compliance with the agreed goals for convergence were required in order for requesting countries to receive assistance from the fund.

Finally, it should be stressed that regional financial agreements are complements rather than substitutes for global arrangements. The principle of additionality must prevail in emergency lending by FLAR, which should complement rather than take the place of IMF credit. By the same token, subregional development banks and FLAR need to coordinate with other international financial institutions in order to promote initiatives for devising innovative financial instruments with a view to furthering the countries' financial development.

Appendix

Graph A.1
TRENDS IN INTERNATIONAL RESERVE STOCKS
(Millions of US\$)

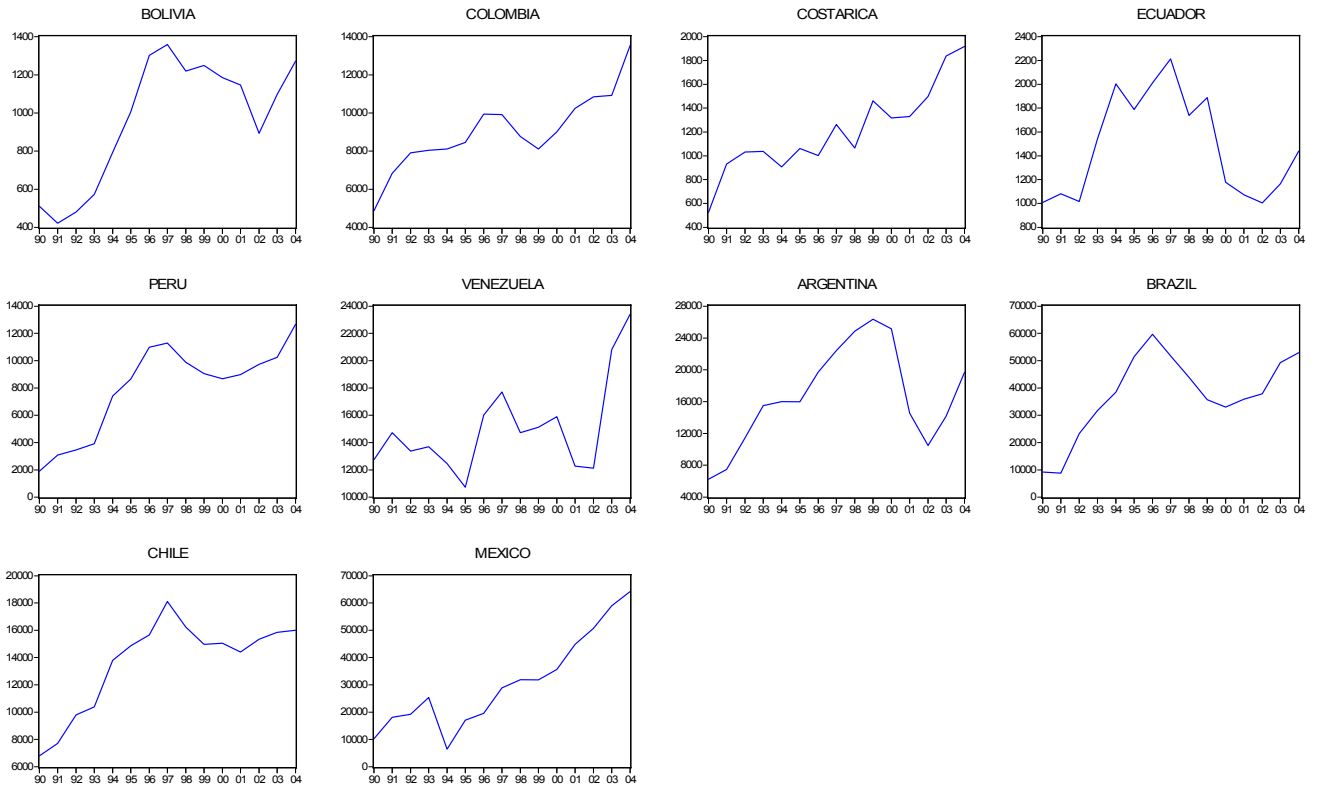


Table A.1
SIMPLE CORRELATION COEFFICIENTS (1990-2005)

International Reserves

	BOLIVIA	COLOMBIA	COSRICA	ECUADOR	PERU	VENEZUELA	ARGENTINA	BRAZIL	CHILE	MEXICO
BOLIVIA	1									
COLOMBIA	0.8551*	1								
COSRICA	0.8308*	0.8117*	1							
ECUADOR	0.7626*	0.7554*	0.5083	1						
PERU	0.9446*	0.9168*	0.7862*	0.8463*	1					
VENEZUELA	0.7572*	0.7962*	0.7978*	0.5710*	0.7071*	1				
ARGENTINA	0.7426*	0.3941	0.4904	0.6151*	0.6075*	0.5103	1			
BRAZIL	0.6184*	0.6256*	0.2749	0.8111*	0.7437*	0.3914	0.4711	1		
CHILE	0.7966*	0.6984*	0.4902	0.8484*	0.8875*	0.4307	0.6240*	0.8867*	1	
MEXICO	0.7559*	0.8526*	0.9330*	0.4522	0.7428*	0.7669*	0.2684	0.2565	0.4048	1

Detrended International Reserves

	BOLIVIA	COLOMBIA	COSRICA	ECUADOR	PERU	VENEZUELA	ARGENTINA	BRAZIL	CHILE	MEXICO
BOLIVIA	1									
COLOMBIA	0.3574	1								
COSRICA	0.2353	-0.1345	1							
ECUADOR	0.5483*	0.5803*	-0.1267	1						
PERU	0.7117*	0.6669*	-0.0954	0.8067*	1					
VENEZUELA	0.6101*	0.5173*	0.5682*	0.3378	0.4624	1				
ARGENTINA	0.8084*	0.1220	0.5063	0.4328	0.4710	0.5854*	1			
BRAZIL	0.4098	0.6420*	-0.3467	0.6969*	0.7810*	0.2738	0.1907	1		
CHILE	0.4747	0.6663*	-0.1628	0.7167*	0.8698*	0.3371	0.3114	0.8385*	1	
MEXICO	-0.1100	0.0102	0.4509	-0.3114	-0.3423	0.3637	-0.0955	0.3391	-0.4069	1

Variation of International Reserves

	BOLIVIA	COLOMBIA	COSRICA	ECUADOR	PERU	VENEZUELA	ARGENTINA	BRAZIL	CHILE	MEXICO
BOLIVIA	1									
COLOMBIA	0.3841	1								
COSRICA	0.1101	-0.1271	1							
ECUADOR	0.4514	0.2692	0.0280	1						
PERU	0.4341	0.6731*	0.0211	0.5594*	1					
VENEZUELA	0.6537*	0.3088	0.4575	0.3736	0.3505	1				
ARGENTINA	0.6474*	0.0433	0.3283	0.3615	0.2506	0.5736*	1			
BRAZIL	0.2402	0.3420	-0.3035	0.2013	0.3577	0.1751	0.1000	1		
CHILE	0.2197	0.4682	-0.0026	0.3032	0.7161*	0.1869	0.1471	0.5546*	1	
MEXICO	0.0057	-0.0830	0.3695	-0.0592	-0.3289	0.2609	-0.0213	-0.2044	-0.4694	1

Terms of Trade

	BOLIVIA	COLOMBIA	COSRICA	ECUADOR	PERU	VENEZUELA	ARGENTINA	BRAZIL	CHILE	MEXICO
BOLIVIA	1									
COLOMBIA	-0.3857	1								
COSRICA	-0.0265	-0.5212*	1							
ECUADOR	-0.4364	0.8548*	-0.3141	1						
PERU	0.1353	0.4311	0.1345	0.3264	1					
VENEZUELA	-0.2040	0.9195*	-0.6262*	0.8300*	0.4396	1				
ARGENTINA	-0.5025	0.7688*	-0.2849	0.6323*	0.4609	0.6951*	1			
BRAZIL	-0.5120	0.2333	0.4063	0.2700	0.2989	-0.0237	0.4723	1		
CHILE	-0.2032	0.8929*	-0.5168*	0.7543*	0.5623*	0.8779*	0.6892*	0.2755	1	
MEXICO	-0.6184*	0.8073*	-0.4232	0.8840*	0.0798	0.7219*	0.6421*	0.3617	0.7373*	1

Capital Flows

	BOLIVIA	COLOMBIA	COSRICA	ECUADOR	PERU	VENEZUELA	ARGENTINA	BRAZIL	CHILE	MEXICO
BOLIVIA	1									
COLOMBIA	0.2769	1								
COSRICA	-0.0359	-0.4145	1							
ECUADOR	0.3048	0.4135	-0.1336	1						
PERU	0.1488	0.5593*	-0.4953	0.0972	1					
VENEZUELA	0.3965	0.0319	-0.2219	-0.1989	0.1681	1				
ARGENTINA	0.6836*	0.3872	-0.5573*	0.0972	0.4093	0.4964	1			
BRAZIL	0.6046*	0.6547*	-0.1858	-0.0183	0.4382	0.3278	0.5000	1		
CHILE	0.4935	0.4956	-0.3870	0.1212	0.6923*	0.0766	0.5912*	0.6294*	1	
MEXICO	0.2735	-0.3849	-0.0200	0.0505	0.2172	0.0372	0.2922	-0.2847	0.3460	1

^a An asterisk indicates that the coefficient is significant at a 5% level.

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