

### **III. Structural transformation of financial systems and its implications for monetary policy in Latin America and the Caribbean**

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#### **Overview**

The structural transformation of financial markets in Latin America and the Caribbean (LAC), may have altered the degree of competition and efficiency of these markets and affected how short-term interest rates, reserve aggregates or the money stock respond to policy actions and non-policy disturbances. As a result, it seems natural to ask whether such transformation has affected the manner in which monetary policy is conducted or the strength and relevance of the different transmission channels through which it operates.

It could be argued that the development in the structure of financial systems responds to changes in central bank operating procedures,<sup>2</sup> rather than the opposite (Archer (2006)). In this case, it is possible that changes in operating procedures could help develop a liquid interbank market, which could in turn reduce interest rate volatility. Furthermore, bank intermediation may also respond endogenously to monetary policy through changes in the level of reserve requirements or in their remuneration.

In general, it is difficult to make any assessment of the causality involved in the relationship between monetary policy operating procedures and the structure of the banking sector. In fact, such a relationship is likely to run in both directions. To disentangle some of these issues, this chapter provides an overview of the use of instruments for monetary control and operating procedures with a focus on smaller economies and on how the transmission of monetary policy may have changed during the last decade.

#### **Monetary control, instruments and operating procedures**

Traditionally, monetary authorities in emerging market economies (EMEs) have relied heavily on direct or non-market instruments for the conduct of monetary policy. Such instruments include interest rate controls, credit guidelines, reserve requirements and lending through the

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<sup>2</sup> Walsh (2003) defines operating procedures as the collective set of rules, traditions and practices required for the implementation of monetary policy. As such, operating procedures differ according to the actual instrument the central bank uses in its daily conduct of policy, the operating target over which control is achieved over short horizons, the conditions under which instruments and operating targets are automatically adjusted in light of economic developments, the information set about policy and the types of announcements the monetary authority might make, its choice of variables for which it establishes targets (eg money-supply growth or the inflation rate) and whether these targets are formal or informal. See Borio (1997) for a very useful discussion on monetary policy implementation in industrial countries.

discount window.<sup>3</sup> Heavy reliance on direct controls has a number of potential disadvantages.<sup>4</sup> First, it can lead to a misallocation of resources, with possibly significant economic costs. Second, it can impair the supply of financial services; for example, high reserve requirements function as an implicit tax on the banking sector. Also, credit is often denied to certain sectors (eg small and medium-sized enterprises) that could potentially add to domestic output and employment. Third, controls are often circumvented by informal or offshore financial sectors that operate in parallel to the formal domestic sector.<sup>5</sup> As a result, monetary management can become a very complicated exercise.

The structural transformation of financial markets, and the process of globalisation have induced changes in policy targets, operating procedures and instruments. Indeed, though some central banks in the region still conduct monetary policy through the use of direct instruments, there has been a gradual evolution towards greater use of indirect instruments that seek to affect overall monetary and credit conditions through the demand or supply of liquidity.<sup>6</sup>

Table 3.1 offers an overview of different operational tools employed worldwide by central banks. It is evident that developing and EMEs still rely on the use of credit and interest rate controls and liquid asset ratios, both of which have largely been phased out in developed countries. Furthermore, all developing countries in the sample rely on the use of reserve requirements. Open-ended standing facilities and discretionary market-based instruments are part of the standard toolkit for the conduct of monetary policy in developing and EMEs. However, the key difference with developed countries is that they are part of a broader set of tools that indicate the presence of important market and institutional shortcomings in these economies.

Table 3.1  
**Use of monetary instruments at various stages of development**

In per cent of the countries in the sample

	<b>Developing countries</b>	<b>Emerging economies</b>	<b>Developed countries</b>
Credit and interest rate controls	4	22	0
Liquid asset ratio (LAR)	65	30	9
Reserve requirements	100	96	70
Open-ended/standing facilities	96	96	100
Discretionary/market-based tools	96	96	100

Note: Data relate to 23 countries in each of the three categories.

Source: IMF (2004).

<sup>3</sup> See Central Bank of Trinidad and Tobago (2005) for a representative summary of interest and credit ceilings and reserve requirement measures used over the decades in a Caribbean economy. Arena et al (2006) provide a good summary of reserve requirements in the region during the last decade.

<sup>4</sup> For a more detailed discussion of the rationale behind the use of direct instruments see Van 't Dack (1999), Agénor (2004) and Hawkins (2005).

<sup>5</sup> For instance, in Ecuador controls were reportedly circumvented by offshore financial institutions, which partially justified the explicit dollarisation of the economy.

<sup>6</sup> For instance several countries in the Caribbean still rely on quantitative instruments (eg Aruba, the Bahamas, Belize and Trinidad and Tobago).

In Table 3.2 we report the current use of operational tools for a selected number of countries in LAC (details are provided in the table's footnote). As shown, credit and interest rate controls have been phased out, Brazil being an exception. However, requirements for a bank to hold minimum amounts of specified liquid assets are more widespread. Table 3.3 also confirms that reserve requirements are a common instrument for the conduct of monetary policy in the region. This is also true of money market operations that is, operations used at the discretion of the central bank and bearing an interest rate linked to market conditions (eg OMOs). Less common is the use of standing facilities (ie monetary instruments used at the initiative of commercial banks and bearing a pre-specified interest rate). However, in economies with fixed exchange rates or currency unions, such as the Eastern Caribbean Currency Union (ECCU), standing facilities can influence banks' lending rates and, therefore, economic activity. Of course, for this to be the case, it is necessary to have a discount rate lower than the rediscount rate for Treasury bills.<sup>7</sup>

The inefficiencies cited earlier suggest that market-based instruments should in principle be a superior alternative. However, the use of such instruments typically requires the existence of developed financial systems that offer monetary authorities a choice of markets in which to operate and guarantee that actions in one market will spread effectively to other markets. In many countries in the region, financial markets are only at an early stage of development and are often incomplete or segmented.<sup>8</sup> Furthermore, they often lack the depth and liquidity necessary for adopting market-oriented monetary policies. In some countries, other factors such as the lack of a stable macroeconomic environment and sound fiscal policies together with a low degree of central bank autonomy have also limited the success of reliance on money market operations for the conduct of an efficient monetary policy (IMF (2004b)).

The underdevelopment of financial markets is reflected in the degree of market segmentation, the lack of securities at longer maturities (resulting in the absence of a full developed yield curve) or the general lack of depth and liquidity in financial markets. In smaller economies, market segmentation has constrained economic development as well as the conduct of monetary policy.

Only recently have the largest economies in the region begun to extend the local currency fixed-rate yield curve to the longer end (Graph 3.1) and there is still room for progress. Furthermore, the lack of liquidity that characterises most of these markets raises questions about the information content provided by yield curves in the region (Jeanneau and Tovar (2006)).

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<sup>7</sup> The ECCB conducts monetary policy through standing facilities by employing discount and rediscount rates, setting differential rates and ceilings for various classes of transactions, determining priority areas for credit distribution in cooperation with member governments, and by establishing a schedule of reserve requirements varying on the type of deposit. See IMF (2004b).

<sup>8</sup> The main focus of this chapter relates to the formal sector. However, the importance of informal and unregulated parallel markets should be kept in mind when assessing the challenges and risks faced by central banks when conducting monetary policy in these countries.

Table 3.2

**Use of monetary instruments in selected economies  
of Latin America and the Caribbean**

	Argen- tina	Brazil	Ecuador	Jamaica	Paraguay	Dominican Republic	Uruguay
Credit and interest rate controls	No	Yes <sup>3</sup>	No	No	No	No	No
Liquid asset ratio (LAR)	No	No	Yes <sup>7</sup>	Yes <sup>10</sup>	No <sup>13</sup>	No	Yes <sup>18</sup>
Reserve requirements	Yes	Yes <sup>4</sup>	Yes <sup>8</sup>	Yes <sup>11</sup>	Yes <sup>14</sup>	Yes <sup>15</sup>	Yes <sup>19</sup>
Open-ended/standing facilities	Yes <sup>1</sup>	Yes <sup>5</sup>	No	No	No	Yes <sup>16</sup>	Yes <sup>20</sup>
Discretionary/market-based tools	Yes <sup>2</sup>	Yes <sup>6</sup>	Yes <sup>9</sup>	Yes <sup>12</sup>	No	Yes <sup>17</sup>	Yes <sup>21</sup>

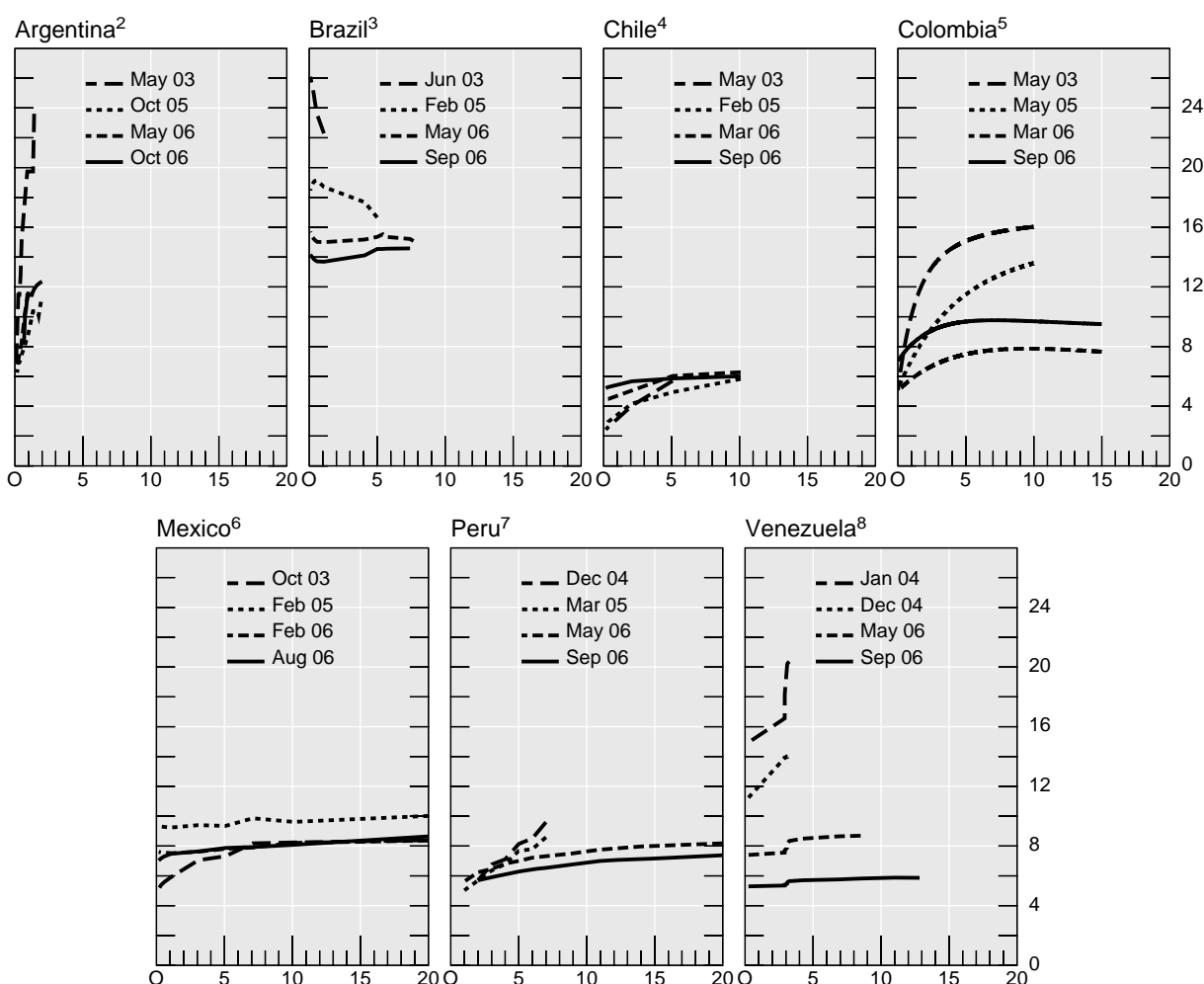
<sup>1</sup> Buying/selling assets under a repurchase agreement. <sup>2</sup> Primary market issuance of central bank securities, buying/selling assets on the secondary market. <sup>3</sup> Shares of demand deposits are to be used on agriculture and micro-credit sectors. Part of savings account deposits is directed either to agriculture or to house financing. Ceilings on interest rates apply. <sup>4</sup> On demand deposits (cash, non-remunerated), time deposits (government bonds) and savings accounts (cash, remunerated). <sup>5</sup> Automatic one-day repo at the end of the day at banks' request. Almost never used given its high cost. Since 2001 there has also been the option to conduct short- and medium-term operations, but this standing facility has never been used. <sup>6</sup> Open market operations (outright, repo, and reverse repo operations on the secondary market - government bonds as collateral). <sup>7</sup> The bank and insurance supervisor requires financial institutions to keep an index of structural liquidity ("índice estructural de liquidez", IEL). This is calculated based on the ratio of liquid assets and callable liabilities in the short run. The minimum IEL will be the greatest value between: the equivalent to 2.5 times the weighted average volatility of the main sources of funding for the institution, or the amount needed to cover 50% of the hundred largest deposits with a maturity up to 90 days (this amount may be adjusted based on the methodologies capturing the deposit concentration index). Financial institutions not meeting the IEL minimum criteria for two consecutive weeks, or within a period of 90 days, will not be allowed to increase the lending balance using own funds or make transactions that affect this indicator. The product of their improvements will be used to reestablish the IEL to its minimum level and, additionally, they will be asked to submit a contingency plan to the supervisor that will include corrective actions. The IEL is used as a prudential regulation but not as a monetary policy instrument. <sup>8</sup> According to the law (artículo 14 de la Codificación de la Ley Orgánica de Régimen Monetario y Banco del Estado), financial institutions operating in the country under the Banks and Insurance Regulator, excluding savings and loans institutions, must keep reserves on deposits and collections according to the judgment of the central bank. This reserve, called the "encaje", will be kept under deposit at the central bank and marginally in cash by the financial institutions themselves. The board of the central bank has determined a unique percentage of the reserve requirement (4%) for all deposits and dollar-denominated deposits and collections raised by public and non-public banks and other financial institutions subject to the control of the Banks and Insurance Regulator. <sup>9</sup> The board of the central bank can authorise the institution to conduct OMOs, with charge to reserves and as a medium to raise liquidity. This is to be done under the following procedures: i) issuance of central bank notes with maturities of less than 360 days; ii) issuance of central bank bonds with maturities of more than 360 days; and iii) repo operations in US dollars, with banks subject to the reserve requirement, and exclusively with securities issued or guaranteed by the state through the Ministry of Economy and Finance. These operations will be exclusively executed with banks with a constituted net worth that exceeds at least the technical net worth required by law and a maturity of less than 90 days. <sup>10</sup> 23% of liabilities. <sup>11</sup> 9% of cash (part of LAR). <sup>12</sup> Open market operations. <sup>13</sup> Indirectly controlled by the National Rating Bank, called CADEF. This is the rating system of the Superintendency of Banks and it is based on the capital, asset, liquidity, management and earnings ratios. <sup>14</sup> Local currency: demand deposits, 15%, 2- to 360-day deposits, 7%, deposits with maturity of 541 days or more, 0%. Foreign currency: demand deposits, 26.5%, 361- to 541-day deposits, 16.5%, 541- to 1,080-day deposits, 6.5%, and deposits with a maturity of 1,081 days or more, 1.5%. <sup>15</sup> 20% on banks' deposits in USD and DOP. <sup>16</sup> Overnight rate at 8% (deposits) and Lombard rate at 18% (loans). <sup>17</sup> Fixed rate central bank certificates for the public and zero coupon auctions for financial intermediaries and institutional investors. <sup>18</sup> Banks have requirements in terms of a percentage of deposits that has to be maintained either in cash, in vaults or at the central bank. Rates are different according to terms and currency of denomination. <sup>19</sup> For foreign currency, a percentage has to be held at the central bank. <sup>20</sup> There is an overnight deposit facility at the central bank (currently with a rate of 0%) and a Lombard rate (currently 10%). <sup>21</sup> The central bank conducts open market operations to regulate the monetary base, normally based on auction techniques over monetary instruments.

Source: Central Banks.

Graph 3.1

**Yield curves of domestic fixed rate local currency government bonds<sup>1</sup>**

In per cent



<sup>1</sup> Remaining maturities in years (O = overnight). <sup>2</sup> Lebac. <sup>3</sup> Swap rates; long-term government bonds (NTN-F). <sup>4</sup> Central bank issues. <sup>5</sup> Zero coupon yield curve. <sup>6</sup> Cetes and government bonds. <sup>7</sup> Government bonds, secondary market. <sup>8</sup> Government bonds (Vebonos and TIF); last auction in the month.

Source: National data.

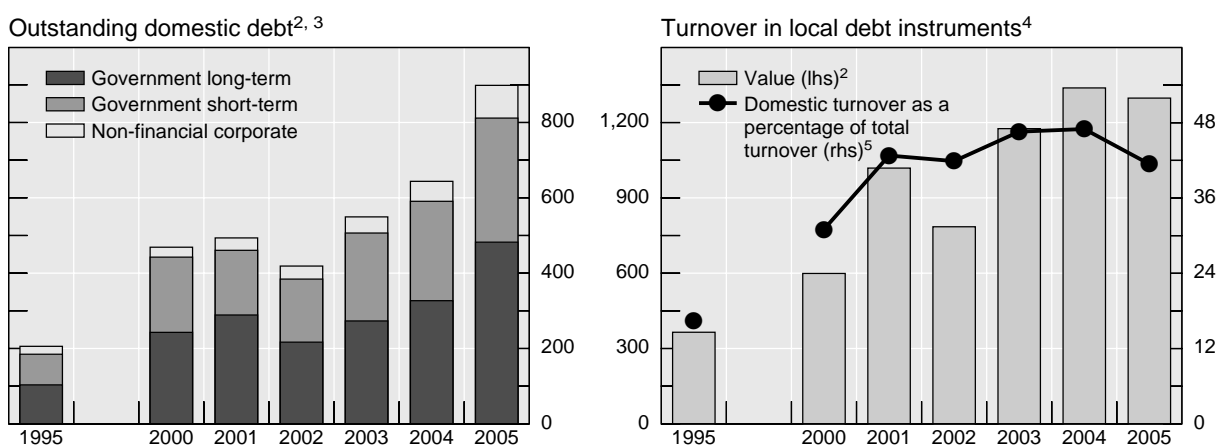
As is well-known, market liquidity is essential for the smooth functioning of financial systems and also for the response of market rates to monetary policy actions. Poor liquidity or a liquidity breakdown under stress can induce large changes in market prices and, in general, complicate the conduct of monetary policy due to its impact on financial stability. In extreme situations, such as those seen in Brazil in 2002 and Colombia in 1998 and 2002, it can lead to the temporary transformation of tradable assets into non-marketable loans, or require government intervention to keep markets functioning.<sup>9</sup>

<sup>9</sup> For instance, in Colombia during the second half of 1998, the yield on government paper (TES) reached 35% compared with 23.6% at the beginning of the year. A similar problem was experienced during 2002, leading to the so-called “mini-TES” crisis. During this period, the government was unable to tap the market for several

In the larger economies of the region, secondary market trading in domestic bonds, a common measure of liquidity, has also expanded in recent years (Graph 3.2, right-hand panel) but it still remains low relative to mature markets (Table 3.3). According to the Emerging Markets Trading Association (EMTA), yearly trading by its member banks in the domestic instruments of the region's seven largest countries amounted to USD 1.3 trillion in 2005, or 1.6 times the outstanding stock of government securities. Within Latin America, moreover, there is considerable variation in secondary market activity. While annual turnover in Mexican securities is five times the outstanding stock, that in Peruvian and Venezuelan securities is less than the outstanding stock (Jeanneau and Tovar (2006)).

Graph 3.2

**Domestic debt in Latin America<sup>1</sup>**



<sup>1</sup> Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. <sup>2</sup> In billions of US dollars. <sup>3</sup> End of period.  
<sup>4</sup> Annual total. <sup>5</sup> Domestic and international transactions.

Sources: EMTA; national authorities.

In the Caribbean, only Jamaica and Trinidad and Tobago are considered to have genuine secondary markets. However they are unsophisticated by developed country standards (Ramlogan (2004)).<sup>10</sup> A number of important initiatives have been undertaken to foster financial market development.<sup>11</sup> For instance, the Eastern Caribbean Central Bank (ECCB) highlights that in the early 1990s the rudimentary issuance of shares by public firms and Treasury bills and bonds by ECCU member governments induced a highly fragmented financial system with eight separate markets. In an effort to remedy this situation, the ECCB promoted the implementation of a capital development programme. In 2002 a regional government securities market was launched, aimed at strengthening and developing the

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months due to the high costs of financing. In 2002, the Brazilian government issued securities indexed to foreign-currency to counter growing illiquidity in the foreign exchange market.

<sup>10</sup> As a reference, in the first nine months of 2005 there were 16 placements totalling \$4.7bn in the bond market of Trinidad and Tobago. All but five bonds were of a 10-year maturity and the remaining securities had maturities of between 9-20 years.

<sup>11</sup> Notwithstanding, some authors such as Nelson-Douglas (2004) used three indicators of financial depth (broad money to GDP, the average and standard deviation of real interest rates on domestic currency deposits in the banking system) to claim that the Jamaican economy's financial development surpasses to some extent those of other Latin American economies. However, these results need to be taken with caution given the imperfect nature of such measures as indicators of financial depth in securities markets.

existing primary market for Treasury bills and bonds, and promoting the development of secondary market for these securities. Also, in October 2001 important changes were introduced to the interbank market to facilitate the market determination of fund rates and contribute to increase interest rate flexibility in the ECCU (ECCB (2003)). In other smaller economies important initiatives have also been taken to develop financial markets.

Table 3.3  
**Indicators of secondary market liquidity  
in local government securities markets in 2005**

	Annual turnover		Bid-ask spread	Average size of transaction related to bid-ask spread
	Billions of US dollars	Percentage of outstanding securities		
Argentina	91.5	187	10-50 bp on fixed rate and inflation-indexed bonds	USD 1m
Brazil	433.0	79	5 bp on fixed rate bonds	BRL 10-50m
Chile	26.0	98	5 bp on fixed rate bonds	CLP 100m
			5-10 bp on inflation-indexed bonds	UF 100,000
Colombia	45.0	132	3-5 bp on fixed rate bonds	COP 2bn
Mexico	696.7	494	3-5 bp on fixed rate bonds	MXN 50-100m
			5-15 bp on inflation-indexed bonds	MXN 5-10m
Peru	2.6	46	10-20 bp on fixed rate bonds	USD 1m
Venezuela	2.8	39	50-100 bp on floating rate bonds	VEB 2.4bn
Total	1,297.6	160	...	...
<i>Memo:</i>				
<i>United States</i>	<i>138,756.0</i>	<i>2,186</i>	<i>0.8-1.6 bp on fixed rate bonds</i>	<i>USD 25m</i>

Note: Annual turnover data for Latin American countries correspond to secondary market transactions reported by major dealers and money management firms to EMTA. Annual turnover for the United States is based on daily inter-dealer transactions in US Treasury securities as reported in the Statistical Supplement to the *Federal Reserve Bulletin*.

Source: Jeanneau and Tovar (2006).

There is no consensus on the extent to which policy makers and, in particular, central banks should foster the development of financial markets. One view is that monetary policy instruments and procedures should accommodate themselves to the level of development of financial markets. An alternative view is that, even if such markets are little developed, central banks should be ready to set the pace of financial development. Based on questionnaire responses provided by central banks in emerging countries, Archer (2006) found that waiting for institutions to evolve before adopting market-based mechanisms may be a less successful strategy than promoting that evolution by adopting such mechanisms as part of a modernisation programme.

In either case, a long period of transition in which market-oriented instruments coexist with quantitative controls is frequently necessary. The sequencing and speed of this transition need to be carefully assessed so that policy makers have enough room to learn about the new environment and financial institutions are able to cope with greater interest rate volatility.<sup>12</sup> Furthermore, it must be recognised that the inherited institutional structure might not be appropriate to a market-driven environment. This is a factor, for instance, when state-owned banks continue to play a significant role or if savings are channelled through national savings institutions.

Among smaller economies in the region, Jamaica is a good example of the challenges associated with the transition from direct towards market-based instruments. The Bank of Jamaica has played a key role in developing the secondary market by holding and trading government bonds of different maturities. However, central bank officials indicate that the process was slow because market participants were not willing to take new risks and, in some cases, asked for explicit guarantees. Transition to market-based instruments made it more difficult to manage liquidity in the economy (in particular, in the context of opening up the economy). It was only when reverse repurchase agreements were introduced that the capacity to manage liquidity was enhanced (Nelson-Douglas (2004)).

### **The evolution of operating procedures**

The changes highlighted in the previous section imply that countries that have adopted indirect instruments still need to ensure that such instruments operate in an efficient and effective manner. Some perspective on this can be obtained by examining the evolution of central bank operating procedures.

Over the last 15 years, as central banks have gained more independence, operational procedures have evolved, altering the dynamics of financial transmission. Experience suggests that countries first established monetary targets, with weights that varied significantly over time. Then, with the advent of financial deregulation and innovation, central banks relied less on monetary targets (due to the sharp decline in the correlation between money and inflation (Graph 3.3)) and switched to operating procedures that targeted interest rates.

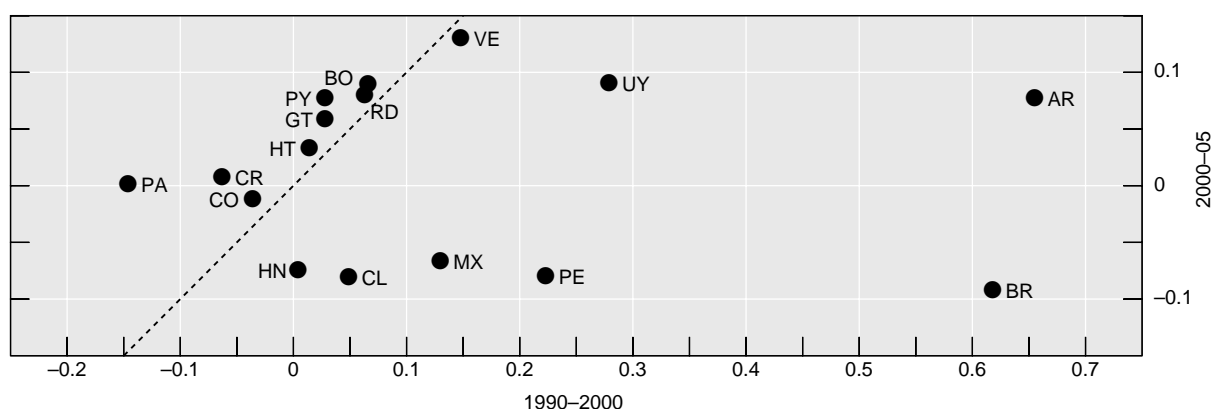
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<sup>12</sup> IMF (2004b) identifies four stages in the development of money markets: (i) Post-conflict countries. Financial reforms involve reestablishing key functions in areas where a central bank has responsibilities; (ii) Developing financial intermediation. Monetary policies rely on rules-based instruments (eg reserve requirements or deposit or refinance facilities available to the banks on demand); (iii) Fostering interbank market development. Money market operations are to be introduced at this stage, but rules-based instruments remain relevant. Economies with limited market participation (eg due to small economic size) may not go beyond this point; and (iv) Diversification of markets. Liquidity management can now start to fully rely on money markets.



Graph 3.3

Correlation between inflation and money<sup>1</sup>



AN = Netherlands Antilles; BB = Barbados; BO = Bolivia; BR = Brazil; BS = Bahamas; CL = Chile; CO = Colombia; CR = Costa Rica; DM = Dominica; DO = Dominican Republic; EC = Ecuador; GD = Grenada; GT = Guatemala; GY = Guyana; HN = Honduras; HT = Haiti; JM = Jamaica; KN = St Kitts; LC = St Lucia; MX = Mexico; NI = Nicaragua; PA = Panama; PE = Peru; PY = Paraguay; SV = El Salvador; TT = Trinidad and Tobago; UY = Uruguay; VC = St Vincent and the Grenadines; VE = Venezuela.

<sup>1</sup> Annual percentage changes in monthly consumer prices and narrow money (M1).

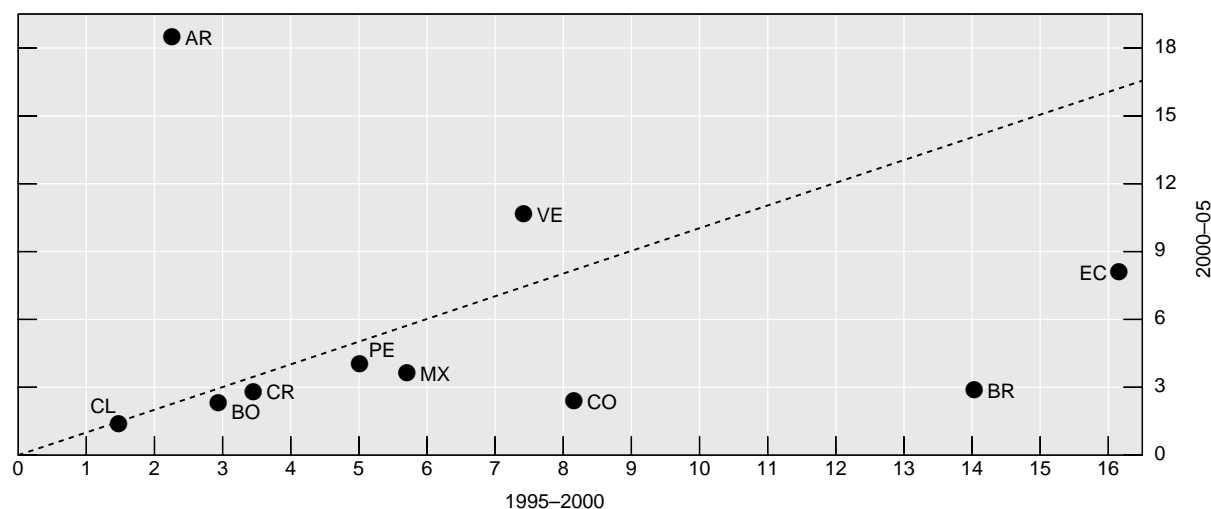
Sources: IMF; Datastream; national data; BIS calculations.

In LAC, changes in operating procedures have been closely related to the exchange rate regime in place. In the 1990s, many central banks targeted the exchange rate, surrendering their capacity to conduct monetary policy. However, the crises and the subsequent adoption of flexible exchange rates<sup>13</sup> encouraged a number of central banks in the region (Brazil, Chile, Colombia, Guatemala, Mexico and Peru) to implement inflation targeting (IT) schemes, which also implied the adoption of alternative monetary policy frameworks. IT is consistent with the use of a short-term interest rate as the principal instrument of monetary policy and the adoption of transparent policy rules to send signals to the market about the monetary policy stance (Carstens and Jácome (2005)). Central banks that have adopted IT now employ overnight interest rates rather than quantity variables as their operational or policy variable (Mexico has been an exception). This facilitates the task of the central bank since such rates are, in principle, easier to control. In fact, as shown in Graph 3.4, interest rate volatility has declined across the region in the last few years. To maintain interbank interest rates, central banks engage in outright open market operations or use repos and reverse repos. However, due to the volatility of interbank interest rates, most central banks have opted for an IT scheme with an interest rate corridor to reduce such volatility.<sup>14</sup> With the adoption of short-term money market rates as an operational target, central banks seek to influence the behaviour of longer-term interest rates and the exchange rate. In turn, this influences aggregate demand and supply.

<sup>13</sup> Only a few countries, mainly in Central America, have kept the exchange rate as the nominal anchor.

<sup>14</sup> The floor of the corridor is typically the overnight rate applicable to a deposit facility for intermediaries that for some reason were unable to place their excess liquidity in the interbank market at the end of the day. The ceiling is usually the rate charged by the central bank to financial intermediaries for overnight lending. This practice is similar to that of some developed economies such as the European Central Bank.

Graph 3.4  
Interest rate volatilities<sup>1</sup>



Note: For a list of the countries included here, see Graph 3.3.

<sup>1</sup> Measured as standard deviations. For Argentina, seven-day interbank rate; for Bolivia, Costa Rica and Ecuador, discount rate; for Brazil, SELIC overnight rate; for Chile, monetary policy rate; for Colombia, interbank overnight middle rate; for Mexico, bank funding rate; for Peru, interbank rate; for Venezuela, monthly average interbank rate.

Sources: IMF; national data; BIS; BIS calculations.

The conditions required for IT to be put in place are: (i) an appropriate legal framework that identifies price stability as the central bank's primary objective; (ii) the empowerment of the central bank with operational independence to achieve such objectives; and (iii) the establishment of rigorous accountability and transparency mechanisms. In addition, any other primary goals or targets must be made secondary to the inflation objective. Fiscal dominance must also be eliminated and the financial system must be strengthened.<sup>15</sup> However, this is not always easy to achieve in practice. In Jamaica one of the obstacles in moving towards IT has been fiscal dominance. In Bolivia and Paraguay the problem has been the high degree of dollarisation. However, Peru offers an interesting case study of how IT can be successfully implemented in a highly dollarised economy (this is discussed later in the text). Finally, in Paraguay and Trinidad and Tobago the obstacle has been the prevalence of excess liquidity in the banking system, which has eroded the role of the policy rate as a signalling device.

The challenges that arise when there is limited pass-through from repo rates to key market rates (eg interbank rates and commercial bank lending rates) are well illustrated by Trinidad and Tobago. As reported in its 2005 *Central Bank Monetary Policy Report*, two thirds of the commercial bank loans outstanding in 2004 were contracted below the prime lending rate. To deal with the lack of pass-through from repo rates to market rates, the central bank has

<sup>15</sup> As discussed in Zoli (2005) there are several channels through which fiscal policy can affect monetary policy. One is fiscal dominance, which is a situation in which a monetary tightening leads to an increase of the government's debt service. The resulting increased deficit is financed through money growth resulting in higher inflation. A second channel is through its direct effect on aggregate demand. Finally, and related to the second channel, is the fiscal theory of price level. According to it a tax cut that reduces the present discounted sum of future primary balances will increase real household wealth. The resulting boost on aggregate demand will determine the price level.

recently adopted new steps to absorb the excess liquidity in the economy and improve conditions for the transmission of interest rate signals. In particular, in addition to open market operations and the more rapid increase in repo rates, the central bank has increased the sale of foreign exchange. Moreover, compulsory deposit facilities for commercial banks and a temporary secondary reserve requirement have been established.

In many countries in the region bank reserves or a broad concept of the monetary base continue to serve as the operational focus of monetary policy (see Table 3.4). For instance, Argentina and Uruguay are among those countries that have put in place a policy of monetary base targeting.<sup>16</sup> One reason for relying on such targeting is that bank reserves may have a reliable and predictable influence on the broader aggregates. Another is that price signals are less reliable in illiquid and volatile financial markets than in more stable ones. This was the rationale for the continued use of a liquidity target, the “corto”, as the main operating target in Mexico.<sup>17</sup> However, other countries, as mentioned above, have continued to rely on monetary aggregates due to the difficulties involved in successfully implementing an IT regime or to the presence of dual goals (eg inflation and exchange rate).

The use of interest rates has become more relevant with financial deregulation and liberalisation. The issue, however, is which interest rate the central bank should focus on as the main or subsidiary target. Van 't Dack (1999) points out that, from a practical point of view, it should be the overnight rate. However, it has proven very difficult for some countries (eg Uruguay) to conduct certain operations that are common in other countries, such as reverse repos, due to the lack of liquid markets. In others, such as Costa Rica, the overnight rate has only recently been adopted with the expectation of setting a floor on short-term interest rates. However, its effectiveness still needs to be tested.<sup>18</sup>

The problem with targeting overnight rates is that they can experience sudden changes resulting from temporary technical pressures, which the central bank may not always want to counteract. In addition, the financial system may be so underdeveloped that the overnight rate simply plays no major role in the monetary transmission mechanism. An alternative is for central banks to rely on interest rates that have a longer maturity than the overnight rate as their operating target (eg South Africa employed a seven-day repo when the new operating target was introduced in 1998, and Thailand until recently targeted a 14-day rate). However, there are drawbacks to this approach. The impact on liquidity will be smaller than in a market for bank reserves, given that the central bank will have limited influence on either the supply or the demand side. In addition, targeting longer-term interest rates may make it difficult to determine how market expectations influence rates at the relevant horizon.

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<sup>16</sup> In Uruguay the monetary policy committee (Copom) has recently decided to move from a monetary base growth target to an M1 growth target, which is considered to be more closely associated with inflation, and which could eliminate the volatility associated with the monetary base multiplier. The Central Bank of Uruguay is expected to continue to follow a policy of monetary base targeting until the right conditions are in place to consider alternatives, such as a system of formal inflation targeting combined with a floating exchange rate.

<sup>17</sup> After the 1994-95 devaluation, the Bank of Mexico faced strong criticism regarding the lack of transparency in the conduct of monetary policy, which led to the use of a visible anchor: a monetary growth target. However, concerns about the risks of using interest rates as an instrument of monetary policy prompted the central bank to use borrowed reserves (the “corto”) as its main policy instrument (Martinez et al (2001)).

<sup>18</sup> Under the current macroeconomic conditions, this floor is expected to limit speculative capital inflows and stimulate investment in longer-term securities.

Table 3.4  
Monetary policy framework

	Exchange rate anchor				Monetary aggregate	Inflation target	IMF supported or other monetary prog <sup>2</sup>
	Dolla-rised <sup>1</sup>	Currency board	Fixed pegs	Crawling pegs			
<b>Central America</b>							
Belize			X				
Costa Rica				X			
El Salvador	X						
Guatemala						X	
Honduras				X			X
Nicaragua				X			
Panama	X						
<b>Caribbean countries</b>							
Antigua & Barbuda		X					
Bahamas			X				
Barbados			X				
Dominica		X					
Dominican Republic							X
Grenada		X					
Haiti							X
Jamaica					X		
St Kitts & Nevis		X					
St Lucia		X					
St Vincent & the Grenadines		X					
Trinidad & Tobago							X
<b>South America</b>							
Argentina					X		
Bolivia				X			
Brazil						X	
Chile						X	
Colombia						X	
Ecuador	X						
Mexico						X	
Peru						X	
Venezuela			X				
Guyana					X		
Paraguay							X
Suriname					X		
Uruguay					X <sup>3</sup>		

<sup>1</sup> Another currency is legal tender. <sup>2</sup> May imply floors for international reserves and ceilings for the central bank's net domestic assets, and consequently also indicative targets for reserve money. <sup>3</sup> Gradually moving to an inflation target.

Source: IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions*, 2005.

## The transmission mechanism of monetary policy

The transformation of the financial sector and operating procedures may have altered the transmission mechanism of monetary policy in two ways.<sup>19</sup> First, it may have changed how instruments directly under the central bank's control (eg short-term interest rates or reserve requirements) affect the financial conditions faced by corporates and households (loan rates, deposit rates, asset prices and the exchange rate). Second, it may also have changed the link between financial conditions and the spending decisions of households and firms. Some of the relevant aspects here are the extent of leveraging, the composition and currency denomination of assets and liabilities, and the degree of dependence on external financing sources, as well as the emergence of new market segments (eg credit cards).

This transformation comes about in part because bank intermediation becomes less dominant as financial markets develop. This is reflected in households placing their savings outside the banking sector, enterprises relying on non-bank sources of financing and banks exploring new markets. Also, the setting of commercial bank rates becomes more dependent on financial market conditions. Furthermore, privatisation and the subsequent reduced presence of state-owned banks also have a bearing on the transmission mechanism. The presence of state-owned banks may complicate monetary policy because such entities enjoy implicit or explicit deposit guarantees or bailout promises. Their deposit and lending rates may thus reflect goals that are incompatible with market conditions and, under some conditions, could be less responsive to policy rate actions by the central bank.

The empirical evidence suggests a change in the transmission mechanism in some economies in the region in recent years. For instance, Gaytán and Gonzalez (2006) find a major structural break in the transmission mechanism of monetary policy in Mexico at the beginning of 2001 coinciding with the introduction of the IT regime. In their paper, they find a stronger response of the real exchange rate and the rate of inflation to movements in the interest rate. Although Gaytán and Gonzalez conclude that IT was the main factor explaining the change in transmission, another possibility was the development of financial markets per se and possibly also a strengthening of bank intermediation in the economy. In fact, in 2000 the government introduced a market-making scheme for government debt and began following a clearly defined public debt management strategy. The result has been impressive growth in fixed income markets since 2000, when fixed rate bond issues were first introduced.<sup>20</sup> The recovery of the banking sector has resulted in a gradual but sustained increase of credit to new market segments, which continues to this day.

Allen and Robinson (2005) also recognise that there has been an important change in the transmission mechanism in Jamaica. Although they do not explicitly test what the nature of change has been about, they acknowledge that it has been driven mainly by the transformation of the financial sector and a progressive opening to trade and capital flows. Robinson and Robinson (1997) argue that monetary policy could not ignore the weakness of the financial sector and an inefficient production structure, and these elements indeed appear to have played a central role in policy making. Allen and Robinson (2005), on the other hand, tend to emphasise the role of expectations for the conduct of monetary policy. Valle (2006) also reports an important structural break in the transmission mechanism in Guatemala in 1997 and 2000, which appears to have been associated with macroeconomic

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<sup>19</sup> For a more detailed discussion, see Kamin et al (1998).

<sup>20</sup> For a discussion of the development of domestic government bond markets in Mexico, see Jeanneau and Pérez Verdia (2005).

imbalances that nearly pushed the country into a balance of payment crisis and which also led to the adoption of the new IT framework.

While changes in the transmission mechanism are associated with the adoption of new policy frameworks, less emphasis has been placed on the immediate and lagged effects of financial crises. For instance, credit supply and demand elasticities to interest rates can be greatly affected by such events. After a crisis an expansionary policy may not induce more bank lending due to weakened firm and household balance sheet positions. Furthermore, worsened balance sheet positions may also induce a shift of resources into government debt, as has recently occurred in Colombia.<sup>21</sup>

In what follows, we discuss how the key monetary transmission channels identified in the literature are affected by banking sector developments.<sup>22</sup> We focus on the interest rate, the credit channel (including balance sheet and credit availability effects)<sup>23</sup> and the exchange rate channel. Finally, how dollarisation may affect the control of monetary policy is also discussed.

### **The interest rate channel**

Two issues are relevant here. The first is whether the transformation of the banking sector has made aggregate spending more or less sensitive to interest rates. Given the prevalence of low credit to GDP ratios in some economies, a significant direct impact of interest rates on aggregate spending is unlikely. However, the recent upsurge in credit growth in some market segments or sectors, such as the household sector, may change the responsiveness of aggregate demand to interest rates.

The second issue is whether structural changes in the banking sector have strengthened the impact of monetary policy on short-term interest rates. The evidence seems to suggest that in the smaller economies of the region, the interest rate channel may be less relevant than in the larger ones. A study by Ramlogan (2004) argues that in countries where capital markets are less developed the interest rate channel is unlikely to play a major role. Her econometric analysis for Barbados, Guyana, Jamaica and Trinidad and Tobago confirms the second order nature of this channel. These results are in line with the limited pass-through from repo rates to key market rates (eg inter-bank rates and commercial bank lending rates) in Trinidad and Tobago (discussed earlier). In other economies, such as Guatemala, evidence supports the growing role of the interest rate channel (Valle (2006)). This appears to be also true for the most financially advanced economies in the region. For instance, Amaya (2006) has found evidence for Colombia supporting a high and quick pass-through of policy rates to commercial bank rates (CDs and credit rates) between 1996 and 2004. Nevertheless, his evidence does not allow for an evaluation of how the effects are transmitted into consumption and investment decisions. Evidence for Chile reported by Espinosa-Vega and Rebucci (2004) find a pass-through similar to that of advanced economies (the United States or Canada). Furthermore, they find no evidence of differences in the interest rate pass-

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<sup>21</sup> In some cases, such as Colombia, this may explain the large exposure of banks to government paper, which created a financial stability problem ex-post (see Vargas (2006)).

<sup>22</sup> This note does not review these transmission channels in detail. For a more detailed treatment, readers are referred to Kamin et al (1998), Agénor (2004) and Archer (2006).

<sup>23</sup> Other channels, such as the asset price channel, are not discussed here. The strength of the asset price channel depends to a large extent on the operation of a long-term fixed rate bond market, which in most cases is still not present in the region.

through among nominal or inflation indexed instruments. The study for Mexico by Gaytan and Gonzalez (2006) also suggests a strengthening of this channel in the most recent years.

Specific structural changes, such as deregulation or consolidation, can also have an impact on the interest rate transmission channel. Although deregulation can take many forms it is possible to illustrate its impact by considering the effect of a removal of interest rate ceilings. In economies with more developed financial markets, it would lead to a greater role for interest rates in allocating credit. The evidence for advanced economies, such as the US, supports this view (Sellon (2002)). However, such an impact for emerging or developing countries has not been studied.

A special Group of Ten report (G-10 (2001)) argued that consolidation resulting in market concentration may affect the interest rate transmission channel in several ways. First, it may lead to more variable margins between borrowing and lending rates. Second, it may influence the lags in the transmission mechanism. In particular, the lags could be reduced if bigger firms can process information faster. Alternatively, the lags could increase if bigger firms are able to exploit customer inertia when official rates change. Unfortunately, the evidence on the pass-through of policy rates to market rates is scarce and inconclusive, even for advanced economies. This is not surprising given that in practice many factors affect the pass-through of policy rates to market rates, such as the introduction of new technologies by financial intermediaries, the development of new financial instruments, the reduction in barriers to entry in some financial markets, and the greater integration of capital markets across countries. Therefore, even if consolidation were to affect the interest rate channel, central banks would have to adjust their policy settings over time in response to the observed changes in pass-through, without needing to identify the precise reasons for those changes.

Whether openness and liberalisation of the financial system have strengthened the interest rate transmission mechanism is also relevant. Archer (2006) finds that liberalisation does not automatically translate into a more powerful interest rate transmission mechanism in EMEs. Indeed, estimates of pass-through of money market rates to commercial lending rates show that the cumulative response of loan rates to a one percentage point rise in money market rates after 12 months did not significantly increase between 1990-94 and 2000-04 (the coefficient only increased from 0.82 to 0.84) for the less advanced economies in his sample (Indonesia, Malaysia, the Philippines and Thailand). Although the explanation for this is not straightforward, one possibility is that increased capital mobility has limited pass-through by strengthening the international convergence of long-term interest rates. Another possibility is that unhealthy financial systems have kept pass-through from rising. For instance, good loans may be crowded out in countries where accounting practices allow bad loans to be hidden, thus limiting the stimulatory effect of lower interest rates. Finally, another possibility is that unhealthy banks do not lend and instead invest most of their funds in government securities.

### **The credit channel**

Monetary policy is likely to have a larger impact if it affects the supply of credit as well as interest rates. Although empirical evidence supporting the existence of a credit channel is limited, some studies suggest that such a channel may be more relevant for emerging economies.<sup>24</sup> This may be particularly true in countries which have less developed financial

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<sup>24</sup> Identifying the importance of the credit channel is complicated in practice because it is not easy to distinguish between tight credit conditions arising from a decline in bank liquid reserves and those arising from a deterioration in the creditworthiness of potential borrowers.

markets or which are subject to direct controls. In general, it is unclear whether the development of the banking sector has strengthened or weakened the credit channel (Archer (2006)). On the one hand, it may have strengthened it because more developed and stronger banks can increase credit to households and firms. On the other hand, it could have weakened it due to agents gaining access to more liquid and deeper securities markets, both onshore and offshore. In addition, financial development may weaken the credit channel if bank access to the interbank market improves. Banks with limited access to this market (because of actual or perceived weakness in their balance sheet) are forced to rely on the central bank for liquidity. These banks are likely to be very sensitive to changes in interest rates. Furthermore, they may attempt to “muddle through” by lowering their credit standards.

In some economies, the lack of development of domestic financial markets has led to the emergence of informal “curb” markets for credit (Kamin et al (1998)) that have a bearing on the credit channel. If these markets are sufficiently segregated from the formal banking sector, the impact of monetary policy may be weakened. This may be the case because policy decisions that affect the formal economy may not be transmitted to the informal market. However, if there is some degree of integration among these markets the transmission mechanism may become even more complex, as resources may shift from one market to the other. For instance, an increase in the policy rate may shift savings from the curb market to the formal banking sector, generating a disruptive decline in credit in the curb market.

A number of studies (Ramlogan (2004) for the Caribbean, Valle (2006) for Guatemala and Allen and Robinson (2005) for Jamaica) highlight the relevance of the credit channel as a key transmission mechanism in the region. However, these studies do not differentiate between the “lending channel” or the “balance sheet” channel as they fail to consider the role of imperfect information and other frictions in credit markets. Thus, these studies fail to capture the amplification effects of direct monetary policy changes on interest rates, say through the finance premium (see Bernanke and Gertler (1995)).

Two studies provide evidence on the lending channel for the region. The first is a study by Alfaro et al (2004) for Chile. This study finds that less liquid banks are forced to curtail the supply of credit following a monetary policy shock, that the access to households and small and medium enterprises to external financing is severely restricted following the drop in the supply of bank credit and, finally, that this decline in bank credit is unevenly distributed due to flight-to-quality effects, thus having a major impact in macroeconomic activity. The second is a study by Arenas et al (2006). This study takes advantage of structural changes in the banking sector to identify the importance of the lending channel in emerging markets, including those of Latin America. They show that loan and deposit growth are highly sensitive to economic activity, in a manner that does not differ significantly across domestic and foreign banks. Some evidence indicates that in Latin America deposits at foreign banks are less sensitive to monetary conditions; this suggests that foreign banks play a stabilising role.

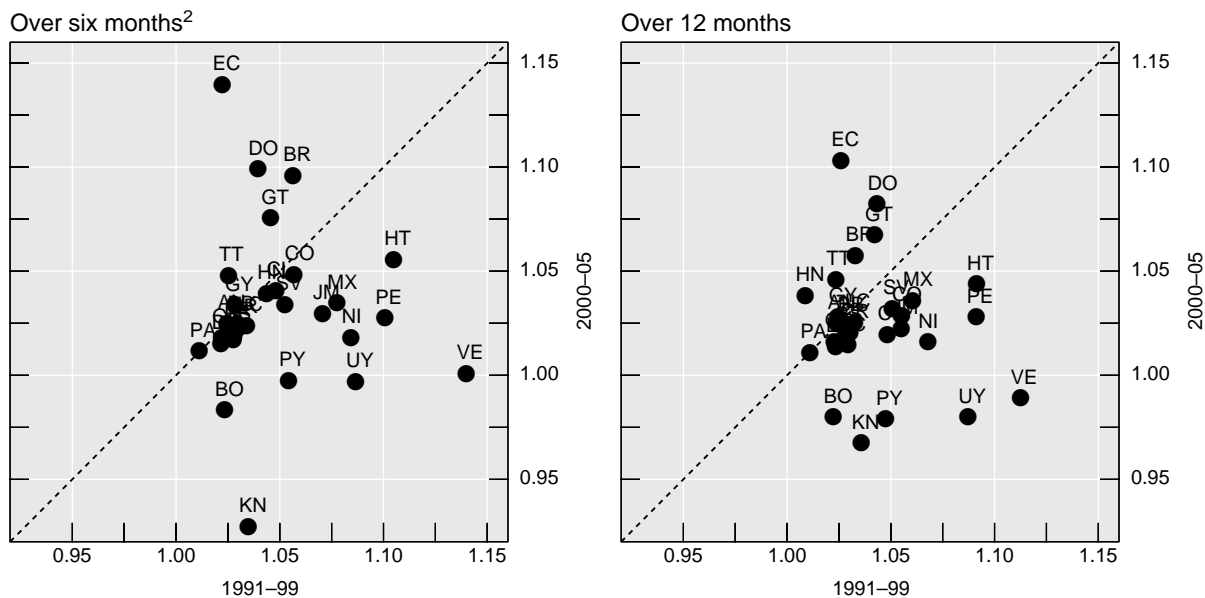
### **The exchange rate channel**

Financial and structural reforms (including the opening of the economy to trade and financial flows) can increase the volatility of exchange rates, generating pressures for exchange rate intervention. In many EMEs, the exchange rate is an important policy variable, whether the country has explicit exchange rate objectives or pursues inflation targeting (eg Colombia,



Guatemala or Peru).<sup>25</sup> The weight policy makers assign to the exchange rate can be influenced by many factors, such as the pass-through to domestic inflation, the source of shocks, the volatility of capital flows or financial and structural reforms.<sup>26</sup>

Graph 3.5  
Exchange rate pass-through<sup>1</sup>



Note: For a list of the countries included here, see Graph 3.3.

<sup>1</sup> Measured as the ratio between the change in consumer prices and the change in the exchange rate (national currency/US dollar); simple mean of the ratios for the periods indicated. <sup>2</sup> At an annual rate.

Source: IMF.

Structural changes at the national and international levels have apparently lowered the pass-through of exchange rate changes to inflation in LAC (see Graph 3.5). However, some exceptions remain (Brazil, Ecuador and Guatemala). The decline in pass-through poses challenges for central banks as the effects of exchange rate movements on expected inflation may be misperceived. This could lead policy makers to overreact to exchange rate developments.

In smaller economies the exchange rate channel may be particularly relevant. For instance, Allen and Robinson (2005) find this to be the most important channel for the transmission of monetary policy in Jamaica. They argue that this is the case because even with monetary base targeting, the monetary base may not convey enough information about current monetary conditions. Exchange rate fluctuations may be more informative.

The exchange rate can also play an important role for the transmission of monetary policy if it affects balance sheets due to financial dollarisation or currency mismatches. For instance, if firms' debts are denominated in foreign currency, while their revenues are denominated in

<sup>25</sup> The exchange rate plays a role in several dimensions. First, the nominal exchange rate can have a role as a shock absorber. Second, exchange rate volatility can affect central bank operating procedures. Finally, it plays a role in determining the monetary policy stance. Of course, this is likely to depend to a large extent on the monetary framework in place.

<sup>26</sup> For a more detailed discussion of these issues, see Amato et al (2005).

local currency, a currency devaluation could result in a deterioration of their balance sheets. This in turn would make it hard for firms to roll-over their debts, which could reduce investment. The adverse effect of a currency devaluation could be amplified if the deterioration in firms' balance sheets raises the cost of new financing.

Tovar (2006) reports evidence on the relevance of the balance sheet effect for Chile, Colombia and Mexico. He shows that devaluations explicitly induced by the central bank are expansionary; expenditure-switching tends to dominate the balance-sheet effect. In contrast, depreciations associated with sudden stops in capital flows are associated with declines in output. The relationship between output and the exchange rate thus depend on the type of shocks that hits the economy.

### **Implications of dollarisation**

The development of banking systems could reduce dollarisation and its relevance for monetary policy. In a number of EMEs dollarisation affects the choice of assets that should be included in the monetary aggregates. Also, in the cases where dollarisation reflects a high degree of currency substitution, monetary aggregates may become more sensitive to sudden shifts in interest and exchange rates. Moreover, dollarisation can be associated with significant currency mismatches, which can force central banks to intervene in the foreign exchange market under certain circumstances (Calvo and Reinhart (2002)). Dollarisation may also affect the choice of exchange rate regime. For instance, a high level of dollarisation may induce high currency volatility under a flexible exchange rate regime, which may be undesirable for a small open economy with an undiversified production structure.

Another strand of literature highlights the fact that dollarisation can weaken the central bank's capacity to conduct monetary policy by reducing the costs of switching to foreign currency, thus increasing the volatility of money demand. A similar argument can be made regarding the dollarisation of domestic savings. As the flight to foreign currency assets becomes less costly (eg due to financial integration), the demand for reserve money in a dollarised economy should be more sensitive to either a monetary expansion or fluctuations in the exchange rate. Levy-Yeyati (2005) finds that in developing countries the elasticity of inflation to changes in the monetary aggregate increases as dollarisation deepens. While these results could imply that financial dollarisation makes monetary policy less effective, they also imply that a reduction in the rate of money growth would have a stronger stabilising effect. This, he argues, is supported by the fact that most developing economies experience a steady decline in inflation despite high and persistent financial dollarisation.

Peru is the only known case of a highly dollarised economy with an IT scheme. As discussed by Armas and Grippa (2006), under such circumstances monetary policy requires special design and implementation. First, the inflation target needs to be low (Peru's is currently at 2.5% +/- 1%, the lowest in Latin America) so that the currency is able to compete with the dollar as a unit of account and a means of payment. Second, forecast models must carefully consider the risks of financial dollarisation. For these reasons it is necessary to implement de-dollarisation policies, internalise the risks of financial dollarisation and limit the vulnerability of the financial system, including the smoothing of exchange rate fluctuations, while allowing a certain degree of flotation. Overall, the Peruvian experience appears to confirm that, with appropriate policy implementation, dollarisation should not impair the effectiveness of monetary policy in achieving low and stable inflation rates. Another interesting lesson from the Peruvian experience is that shifting from a monetary aggregate to an interbank interest rate has contributed to establishing a more predictable and transparent monetary policy. In addition, it has favoured the issuance of long-term financial instruments, thus helping reduce financial dollarisation.

## **Concluding remarks**

Most countries in LAC are in the transition towards market-based mechanisms for monetary policy implementation. This has led to a change in the manner in which monetary policy affects the financial system and the economy. Although the transformation in the financial structure of the economy could lead to changes in the operating procedures for monetary policy, the reverse may also be true. In line with this, evidence from Jamaica suggests that changes in the monetary policy framework can induce a transformation in the structure of financial markets.

A question of interest is whether market-based mechanisms have strengthened monetary control. Evidence concerning the region is limited, but it appears that in the last few years there has been a weakening of the transmission channels of monetary policy, as the pass-through from policy rates to interest rates has remained broadly stable, while the pass-through of the exchange rate to inflation has declined. However, most of these changes are unlikely to be driven exclusively by the transformation of the banking sector.