José De Gregorio: Monetary policy and financial stability – an emerging markets perspective

Presentation by Mr José De Gregorio, Governor of the Central Bank of Chile, at the Brookings Institution, Washington DC, 17 September 2009.

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It is a pleasure to participate in this meeting and to speak about the lessons for monetary policy the current crisis is teaching us. The big difference between the current crisis with previous ones in emerging economies is that this time "it was not our fault." The evidence on the performance of emerging countries facing an unprecedented global downturn shows that some lessons have been properly learned.

Today I would like to concentrate on inflation targets, especially in the context of strongly rising and strongly falling commodity prices, financial stability and exchange rate fluctuations. Many of the issues I will be discussing today I have covered in recent presentations elsewhere. Indeed, there is not much new material, but I think those are important issues in conducting monetary policy in emerging countries.

1. The causes of the crisis: was it monetary policy or was it financial fragility?

The argument blaming monetary policy for the current crisis claims that low interest rates combined with large current account surpluses in emerging economies, particularly Asian and oil-exporting ones, created an abundance of liquidity that triggered excessive increases in asset prices (bubbles). This was particularly acute in the housing market. When the bubble burst, the crisis erupted. Then, this argument claims that the housing bubble was caused by monetary policy, which failed to act opportunely and permitted severe imbalances to accumulate. Nonetheless, one must bear in mind that soaring asset prices do not necessarily end up in a crisis like this one. Closer attention must be paid to the financial fragility that accompanied this process, whose main culprit was the unrestrained financial innovation that generated deep distortions that neither markets nor regulators were able to predict.

An expansionary monetary policy can undoubtedly induce an excessive increase in the prices of assets and credit. The ultimate role of monetary policy is to smooth the business cycle and control inflation.[1] Therefore, it is possible to think that a very expansionary monetary policy, more so than that needed to reach the inflation target, can exacerbate an economic boom. Moreover, such a policy will have serious consequences on output once the monetary impulse is withdrawn. However, an expansionary monetary policy could not explain by itself the severity of the financial collapse and the global recession the world is seeing today.

There are countries where monetary policy was expansionary, with interest rates at their minimum, and no housing bubble nor financial collapses occurred. A couple of examples are Canada and Chile, two inflation targeters where, consistently with this policy framework, interest rates hit very low levels not so different from the Fed Funds rate (Figure 1). Still, housing prices generally did not experience increases comparable with those of other economies, and their financial systems have remained sound.

Furthermore, in some cases housing prices did go up high, with clear indications that there was a bubble. However, their financial systems made it through and remained stable and,

[1] A flexible inflation targeting regime balances the cost of output fluctuations with those of inflation instability, and the result should be a decline in both, output and inflation volatility. For an exposition of this framework and how it relates to the definition of the inflation target parameters see De Gregorio (2009a).

despite the current difficulties, have avoided acute financial crises. This is the case of, for example, Australia and Spain. Naturally, when facing disproportionate increases in housing prices, both the increase in credit and the boom in construction are symptoms that the downturn will be severe. Still, this need not result in a systemic financial meltdown.

In any case, monetary policy can and does help in the creation of bubbles, although not so much by the level of the interest rate but by the monetary policy strategy with which financial turmoil is dealt with. In the United States, the strategy of turning a blind eye to the period of soaring asset prices and then, when the bubble burst, reducing aggressively interest rates used to be the Fed's strategy (the "mop-up strategy" according to Blinder and Reis, 2005). This approach was first used on the "Black Monday" of October 1987, then with the breakdown of *Long-Term Capital Management* (LTCM) and later with the bursting of the high-tech bubble. In all these occasions, once the asset prices reversed down, there was an abrupt relaxation of the monetary policy.[2] This implicit insurance, popularly known as the *Greenspan put*, certainly makes the creation of bubbles more likely. This strategy, which worked in some earlier episodes, failed miserably during the biggest collapse in decades. A monetary policy strategy that used to provide insurance to speculation in episodes of limited financial turbulence proved incapable of confronting a financial crisis of systemic proportions.

This strategy to deal with bubbles is a prescription derived not from inflation targeting, but from a need to insure financial stability. In my view, financial stability must be addressed first with appropriate regulation of the financial system that limits the excesses we saw before the crisis. There may be situations in which it might be appropriate to deviate transitorily from an inflation targeting regime in order to ensure financial stability, but this must be an exception, which in normal times should not arise. I think a first lesson for the conduct of monetary policy is to avoid providing insurance to speculators, which creates enormous moral hazard problems. In emerging countries we have lived this, with much milder consequences, when we attempted to manage exchange rates disconnected from fundamentals for a prolonged period of time.

Therefore, an examination of monetary policy and financial dislocations around the world suggests that the culprit of the current crisis was related more closely with the functioning of financial systems than with monetary policy. One issue that will have to be carefully examined in the future is the cause of the real estate boom and the housing crisis, and why it occurred in the United States. At this point it is clear that lending standards were relaxed beyond reason, and financial innovation went too far.[3]

2. Inflation targeting and asset prices

A corollary of those blaming monetary policy is that, apart from focusing on the variation of the prices of goods and services, it should also take into consideration asset prices, beyond their direct impact on projected inflation.

Under an inflation targeting regime, increased lending and asset prices can have repercussions on the inflation outlook, through their impact on the output gap. This would require a monetary policy adjustment to prevent a persistent rise in inflation. Hence, in an inflation targeting regime, asset prices and the level of credit aggregates affect the monetary policy decision to the extent that they affect the inflation perspectives (Bernanke and Gertler, 1999).

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[2] Interestingly and, according to Blinder and Reis (2005), using Taylor rules as from the first quarter of 1988, the residuals indicate that in all the mentioned episodes the Federal Reserve set the interest rates significantly below those prescribed by the rule.

[3] Ellis (2008) shows that in the U.S., households had strong motivation to increase their leverage through tax, legal and regulatory incentives.

However, some will argue that monetary policy should react directly to asset prices, for example, by including them in the Taylor rule. Cecchetti et al. (2000) are perhaps the best representatives of this position, claiming that any inflation-targeting central bank should react to asset price misalignments *beyond* their implications on expected inflation over the policy horizon.

In my view, there are three reasons why monetary policy, in general, should not react to asset prices beyond their impact on projected inflation:

- First, it is not clear that an increase in interest rates will be capable of stopping an increase in asset prices. The required adjustments might be so large that they could end up unnecessarily generating high unemployment and an undesired drop in inflation.
- Second, what matters here is to safeguard the stability of the financial system. An excessive interest rate aiming at controlling asset prices could even trigger financial instability, which is precisely what it is meant to avoid, especially if the increase in asset prices is accompanied by higher financial fragility.
- Finally, under inflation targeting, any interest rate movements that are inconsistent with inflation converging to the target may undermine the credibility of monetary policy, destabilizing inflationary expectations, and weakening the effectiveness of monetary policy. This is particularly important in the case of emerging economies with a shorter record of monetary stability.

Another reason that has been put forward to not try to affect asset prices through monetary policy is simply that it is impossible to determine when prices are significantly misaligned with their fundamentals. Although I agree with the fact, I do not think this is a strong reason. Indeed, even though it is difficult to determine when prices are fundamentally misaligned, policymakers should worry about this phenomenon. However, acting through monetary policy may not be the best option, and it is better to look more closely at financial regulation and how to limit the procyclicality of the banking system and build enough cushions for the downturn. This should also reduce fragilities that are generated during the upturn.

3. Inflation targets, exchange rates and intervention

An inflation-targeting regime, where the policy instrument is the interest rate, must operate within a context of a flexible exchange rate. This solves efficiently and unambiguously the well-known impossible trinity for countries financially open, and allows the control of interest rates at a level consistent with the inflationary objective. Adding an exchange rate objective weakens the capacity to control the interest rate, affecting the ability to meet the inflation target.

However, the exchange rate generally has effects on monetary policy, since persistent movements of it do affect inflation. In this case, the natural result is a *leaning against the wind*. When the exchange rate appreciates substantially, it prompts a fall in inflation in the medium term, which results in a reduction in the interest rate. This, in turn, induces pressures for depreciation. However, one must recognize that these are not very significant effects because, in a floating regime, the pass-through coefficient from the exchange rate to inflation is limited.[4]

Emerging economies may feel tempted, after a long history of crises caused by exchange rate misalignments, to keep their currencies depreciated. Managing the exchange rate is, apart from hardly feasible in the medium to long term, risky. In the first place, in less flexible

[4] For a recent discussion on the Chilean evidence see De Gregorio (2009b).

exchange rate regimes, the pass-through from exchange rates to inflation increases, because the level of the exchange rate may become a coordinator of price expectations, given the policymakers' commitment to exchange rate stability. This, in turn, feeds back to increased pressures to keep the exchange rate stable, thus aggravating the problem. Secondly, a commitment of the authority with exchange rate stability may create perverse incentives to financial risk taking, by artificially lowering the cost of borrowing abroad. This reinforces fear of floating (Calvo and Reinhart, 2002), creating a *spiral towards exchange rate rigidity*, and deriving in currency mismatches and exchange rate misalignments that the policies were intended to prevent in the first place.

I am not saying that attention must not be paid to the exchange rate beyond its effects on inflation. The exchange rate is an important determinant of resource allocation, and hence, excessive deviations from fundamentals may create distortions. However, I think a sensible way to address signs of severe misalignments, beyond the *leaning against the wind* with monetary policy, is through sterilized intervention. But, in order for this to be effective and coherent with the inflation targeting framework, some conditions must be met:

- In the first place, it must be consistent with the inflation target, in order for the intervention not to jeopardize the credibility of monetary policy.
- Secondly, to safeguard monetary policy independence, once the intervention is announced, it must be implemented mechanically. All this shields the conduct of monetary policy, typically carried out in regular pre-established meetings, from the extraordinary decision of buying or not buying foreign currency. In particular, the sterilization of intervention decisions permits to preserve both the credibility and the independent management of monetary policy.
- Finally, and because of this sterilization requisite, the cost of intervention must be properly considered, because it entails a quasi-fiscal component that could be significant.

The Chilean experience last year was in line with the aforesaid principles. It was done in a moment where there was clear evidence of misalignment with respect to the levels deemed consistent with long-term fundamentals. It was also totally consistent with the inflation objective, and started at a moment – April 2008 – in which there were rather benign inflation figures that revealed a smaller risk of unwanted inflationary propagation. Towards midyear it was even possible to raise the interest rate substantially to tackle a surprise rise in inflation that was much deviated from the target. This was so thanks to the fact that the purchase of dollars was being carried out mechanically, despite a significantly depreciated exchange rate after the intervention. The purchase of foreign currency was concluded prematurely due to global tensions in global liquidity in dollars in September of last year. The capacity of the Chilean economy to subsequently deal with a significant exchange rate depreciation, with monetary easing prospects and reduced inflationary pressures, is proof that there was no inconsistency between the decision to intervene and the conduct of monetary policy (Figure 2). It also shows that the flexible exchange rate regime adopted early this decade has the economy well prepared to absorb exchange rate fluctuations without the turmoil that used to come with them in the past.

4. Bubbles, exchange rates and capital inflows in emerging economies

Latin America went through a period of large capital inflows in the first part of the 1990s (Calvo et al., 1996). We cannot disregard the possibility that after the current crisis is over, there will be a reemergence of inflows to emerging economies. Therefore, there could be strong pressures for a sharp increase in the valuation of domestic assets, with a potential bubble in their prices, and this bubble could take the form of an exchange rate appreciation.

To begin this discussion, I should emphasize that capital inflows to capital-scarce economies are a good thing. We know that capital flows to institutionally strong economies are beneficial (Prasad et al., 2002). Therefore, the role of policy is not to impede capital flows, but to avoid the creation of a bubble in domestic assets with consequences on resource allocation.[5] In this regard, to have in place sound prudential regulation during periods of abundance of capital is essential for financial stability, as we are reminded by the crisis in Chile in the early 1980s, the Mexican crisis of the mid-1990s, the Asian crisis, and more recently, the crisis in Eastern Europe.

Even if one could accept that monetary tightening could be an appropriate response to combat an asset price bubble such as the recent housing price bubble, with all the caveats I discussed before, the problem is more acute in small open economies. Tightening monetary policy may have perverse effects, since it induces further capital inflows and strengthens the currency. In this case, the interest rate is not the most adequate instrument with which to burst the bubble.

Indeed, the perverse dynamics are as follows: high interest rate differentials induce capital inflows to arbitrage those differences; then policymakers strive to avoid the appreciation, which in general is thought to be transitory, since the sustainability of exchange rate management is limited; the incentives for inflows increase as not only the interest rate differential is large, but also the expectations of appreciation; finally, the appreciation takes place, which validates the expectations of arbitrageurs. This process goes for a while and may be accommodated gradually or ended by a sudden stop. In this process there are "excess" inflows and "excess appreciation", and the issue is how to avoid those excesses.

According to the simple dynamics I have just described a first line of defense to avoid excess fluctuations of capital flows is to maintain exchange rate flexibility. This prevents investors from speculating against an authority that will be defending the parity only transitorily. Moreover, by introducing volatility it increases the risks of a one sided bet on the exchange rate.

An inflation commitment may also help to stabilize flows. As I discussed before, massive inflows that appreciate the currencies will result in a loosening of monetary policy that should reduce the incentives for carry trade. In contrast, if capital inflows generate a boom of activity, without inflationary consequences due to the appreciation of the currency, there could be the temptation to tighten monetary policy, aggravating the problem of massive inflows. To control expenditure without increasing pressures on the exchange rate, fiscal policy should help.

A credible inflation target with a flexible exchange rate regime should help to avoid the problems we faced during the 1990s. Indeed, during the period of large capital inflows, no monetary policy in Latin America operated under a full-fledge inflation targeting regime, and most countries had some form of exchange rate rigidity.

Despite having a flexible exchange rate and an inflation target in place, the effects on the exchange rate could reflect that domestic asset prices could be forming a bubble. In this case, sterilized intervention, without an explicit objective on the level of exchange rate, can also help. I already discussed some principles to guide sterilized intervention within an inflation targeting framework. A much debated proposal is the use of capital controls. The

[5] In addition, a traditional concern is that with the same speed as capital flows in, capital may flow out, generating costly adjustment processes. See Cowan et al. (2007) for a review of sudden starts and sudden stops around the world. Sudden stops of inflows are as common in developed as in emerging countries, but in the former, the sudden stop tends to be offset by a return of domestic capital invested abroad, while in the latter it results in a severe squeeze in the capital account. Accumulation of reserves or another form of insurance should help to avoid large swings.

evidence on their effectiveness is elusive.[6] Effectiveness is also severely impaired as domestic financial markets have reached some degree of development and integration with the rest of the world. With hindsight from the current crisis, one can think that rather than controls, what is needed is a prudential regulatory framework to avoid speculation and high risk taking in the banking system.

5. The rise and fall of inflation

In this section I will review inflation behavior in Chile, a country that had the sharpest increase in inflation among emerging economies in the run up of commodity prices, but also the largest decline since the crisis erupted (Figure 3). The most remarkable component of the inflationary process of 2007-2008 was how strongly the increase in international food prices was transmitted domestically. Inflation rose from a y-o-y rate of 2.6% in December 2006 to 9.9% in October 2008. Then, it declined to -1.0% in August 2009.

What accounts for the steep rise in inflation? It may partially be due to Chile's high degree of commercial openness. There are practically no barriers to imports, no widespread protection of agriculture, nor any large-scale distortions in the market pricing mechanism, so changes in external prices are quickly reflected in the domestic market. In fact, at least during the greater part of 2007, growing inflation was mostly caused by increasing food prices, rather than by a widespread inflationary process (Figure 4).[7]

The 2007-2008 food price shock was partially considered to be a one-off change in global relative demand and supply, such as the increased use of biofuels that should have no severe medium-term inflationary implications. However, with inflation rising, the monetary policy rate (MPR) was raised by 125 basis points in the second half of 2007, in order to mitigate undesirable second-round effects of the supply shocks (Figure 5). [8]

By early 2008, the inflationary situation was still a complex one, but risks had decreased, and inflation was expected to reach its target thanks to the monetary policy actions already in place, lower world growth and a strengthened peso. Trend inflation tempered and monetary policy remained unchanged. During this period we decided to initiate a process of reserve accumulation. Nevertheless, halfway through the second quarter of 2008, the inflation path radically changed; the inflationary trend resumed, unexpectedly, with monthly inflation reaching more than 1%. The risks of inflation remaining above the target beyond the policy horizon also grew strongly. Consistently, monetary policy also had a strong reaction. The MPR was increased by 200 basis points in just four months. By September 2008, before the collapse of Lehman Brothers, the Central Bank estimated that it would be necessary to raise the MPR further, even above market expectations.

Finally, inflation reached its 9.9% peak in October. It is still early to determine with a great degree of certainty the strong and sudden propagation of foreign shocks on domestic

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[6] For a review of the Chilean experience, see Cowan and de Gregorio (2007). The only empirical study that found some effects of reducing the extent of the appreciation is Edwards and Rigobon (2009), however the magnitude of such effect is small, since the elimination of capital controls from its maximum would have appreciated the exchange rate between 2 and 2.5%. In any case, it is useful to remind that the most appreciated real exchange rate in the last 20 years in Chile occurred in 1997, year in which there were capital controls, massive reserve accumulation, an exchange rate band and high interest rates.

[7] Another factor underlying inflation pressures and a deceleration of growth was the higher cost of energy. Not only had thermoelectric power plants to operate with more costly inputs, but also unfavorable hydrological conditions and the shortage of natural gas implied that these more efficient sources of generation had to be replaced by diesel.

[8] For simulations on the monetary policy response to an oil shock see Desormeaux et al. (2009). They conclude that the response should be moderated when the shock is transitory and policy is credible. A much stronger response is suggested by Batini and Terenau (2009).

inflation. Inflation propagated to most prices, so core inflation also increased sharply. The output gap increased slightly during the third quarter,[9] although domestic demand was growing strongly (Figure 6). The exchange rate did not add significant inflationary pressures. Perhaps, the sharp increase in oil prices – which came close to 150 dollars per barrel – caused a generalized rise in domestic prices. A strong demand and a large cost shock may have induced an unusual fraction of price-setters to adjust prices, despite the fact that the output gap did not change significantly. However, if this had been the case, prices should have remained more stable rather than experiencing a sharp fall after commodity prices started falling.

As in most of the world economies, financial tensions were severe after the collapse of Lehman Brothers. Interest rates in both peso and dollar markets posted substantial increases in the most stressful times from mid-September to mid-October 2008 (Figure 7). The Central Bank acted quickly, providing peso and dollar liquidity facilities to the financial system to ensure resource availability would foreign loans become scarce. These facilities, which will be in place throughout 2009, have not been used extensively by financial institutions, reflecting their sustained access to external markets. This is an example of how monetary policy can react to mitigate financial turbulences without affecting the path of monetary policy considered to be consistent with the inflation target.

Beyond the stressful episodes in local money markets, the world financial crisis and its aftermaths in the real sector have caused a significant drop in domestic demand and economic activity. Lending standards have certainly tightened, but the Chilean economy is far from suffering the problems that other countries are facing.

Accordingly, the inflation outlook changed significantly, while monetary policy reacted with a change that was large in magnitude and swift in implementation. October 2008 was the month where y-o-y inflation peaked. November brought some relief, largely determined by the drop in fuel prices in world markets. By then, no break in the inflationary trend was foreseen. Nonetheless, given the weakening outlook for activity and inflation, the Central Bank not only did not raise the MPR – which was the most likely path of monetary policy as discussed in September's Monetary Policy Report presented to Congress – but also communicated that the most likely course of action would be an easing of policy by early 2009.

In January 2009, with a clearer assessment of the reduced inflationary pressures, the MPR was lowered by 100 basis points. Later, with the evidence of alleviated inflationary pressures and drastic increases in downward risks to growth and inflation, the Central Bank decided to cut the MPR by 250 basis points at both its meetings of February and March. The monetary easing process continued and completed 775 basis points in seven monthly meetings, bringing the MPR to 0.50%, the minimum level deemed adequate for a normal functioning of money markets. In addition, the Central Bank adopted some non-conventional monetary policy measures, extending the overnight liquidity facility for banks at the MPR to 180 day tenors and cutting the issuance of 1- and 2-year Central Bank bonds. It has been also announced that the MPR will be held constant at this minimum level for a prolonged period of time, and that it will use with flexibility all the monetary policy tools at hand, which goes way beyond setting the MPR every month.

Several lessons and challenges arise for the Chilean experience. First, the volatility of inflation has been very large. This could be explained by the severity of the shocks hitting the economy, but this is not so clear when comparing with other countries. Although it was argued that indexation could be resuming and inflation would stay high, the turnaround was impressive, and hence, it is not clear how persistence has evolved, and it is difficult to

[9] The output gap is actual output minus potential output; hence, an increase refers to a rise above potential output.

explain with a simple linear adjustment. It could be argued that the change in inflation is due to the impact on inflation of the widening of the output gap. However, the output gap changed little when inflation was rising, and the current decline cannot be explained by the current narrowing of the output gap.[10] We used to think that the output gap, as a proxy for marginal cost, is what affects inflation, but the Chilean experience was more of a large swing in the growth of domestic demand rather than output. However, the connection from domestic demand to inflation is less clear than that of the output gap. Finally, the degree of openness and competition in the Chilean economy may increase the sensitivity of prices to demand conditions. More work would have to be done to fully understand the dynamics of inflation, but still the inflation targeting framework has been very useful to conduct monetary policy and to stabilize inflationary expectations.

6. Concluding remarks

Although more often than not, central banks have an explicit financial stability objective, for many years, and within a context of strong GDP growth and sound balance sheets of banks and firms, this was a second-class issue. Now things have changed dramatically. As of last year, financial stability became the protagonist in monetary policy management in developed countries.[11]

Central banks need to oversee price stability and financial stability. To pursue two objectives, one instrument, namely the interest rate, is not enough. Indeed, a well functioning financial system strengthens the transmission mechanism of monetary policy. There may be exceptional occasions in which both objectives may collide, for example when monetary policy requires an increase in the interest rate, while financial stability calls for a reduction. Another example could be a bubble in the exchange rate with high inflation. In the context of monetary policy in an inflation targeting regime, those situations could be accommodated by escape clauses. But, more in general both objectives should be addressed with more than one instrument.

The overall purpose of financial stability is to ensure the proper functioning of markets and to avoid having to arrive at the degrees of turbulence and dislocation we have witnessed in the past year. For this reason, financial regulation plays a major role in granting financial integrity. At the beginning, regulation focused on the strength of individual institutions. However, the tensions we have seen show how individual fragility may quickly evolve into systemic problems. The interrelationships among financial institutions and the proper operation of the markets where liquidity is traded are essential ingredients of a market economy, but these characteristics are also the channels of financial contagion, as recently seen. So it is crucial to have a systemic vision, not only from the perspective of how the different institutions relate to each other, but also on how the different types of financial and operating risks are intertwined, creating potential vulnerabilities.

Regarding price stability, conducting monetary policy within an inflation targeting scheme is appropriate, and recent experience shows that it may provide ample room for expansionary policies when facing a global recession such as the current one. There will be a long debate and a number of research papers on the proper mechanism to secure financial stability and how it should be combined with monetary policy management. However, the current

[10] For example, the output gap fell between 8 to 10 percentage points, which could explain, without lags, a decline of about 3 to 4 percentage points in inflation, by applying textbook Phillips curve or more complex estimations (Brayton and Tinsley, 1996) for the US, which are not very different from those of Chile. The actual decline in inflation in Chile has been about 10 percentage points.

[11] The Fed does not have an explicit financial stability objective, although its role in this matter is widely known. See, for example, Plosser (2007).

experience in many emerging markets is a demonstration that the objectives of financial stability and price stability can be preserved even under extreme tensions.

In sum, conducting monetary policy through an inflation targeting regime, with flexible exchange rate, clear mechanics for exceptional sterilized intervention only when there are clear signs of misalignments, a countercyclical fiscal rule, and a strong financial regulatory framework has worked quite well to mitigate the effects of the worst crisis the world has faced in several decades.

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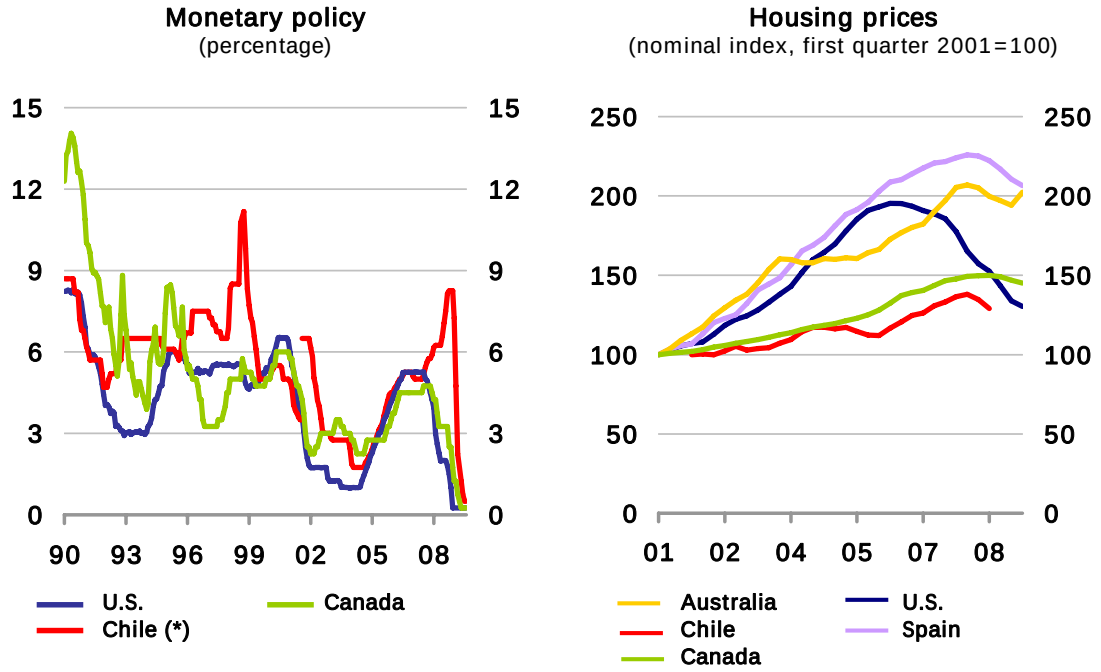
Figure 1
Monetary policy and housing prices



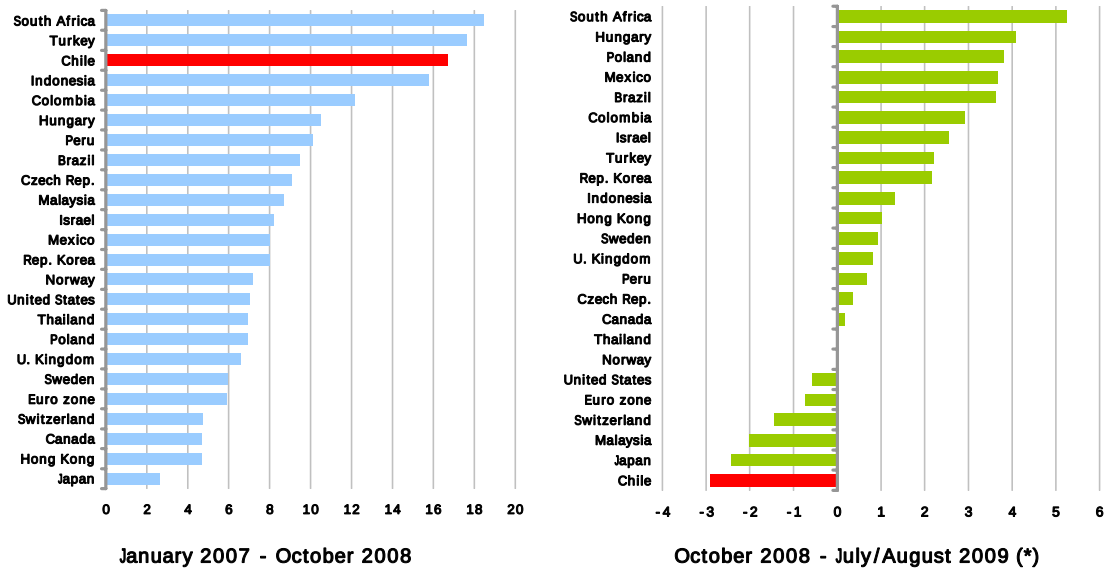
(*) Starting August 2001, the MPR is set in nominal terms. Previously, it was set in inflation-indexed terms.

Sources: Central Bank of Chile, Bank of Canada, Bloomberg and U.S. Federal Reserve.

Figure 2
Nominal exchange rate
(CLP/ USD)

Source: Central Bank of Chile.

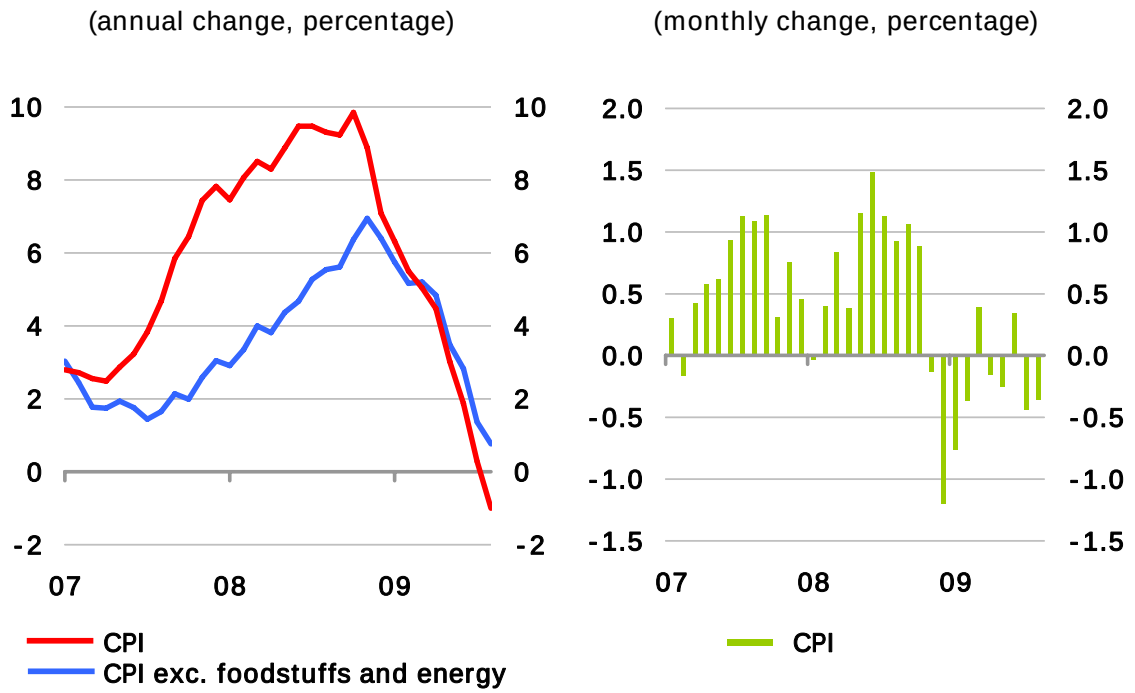
Figure 3
Accumulated CPI change
(percentage)



(*) August figures for Brazil, Chile, Czech Rep., Indonesia, Mexico, Norway, Peru, Rep. Korea, Switzerland, Thailand and Turkey.

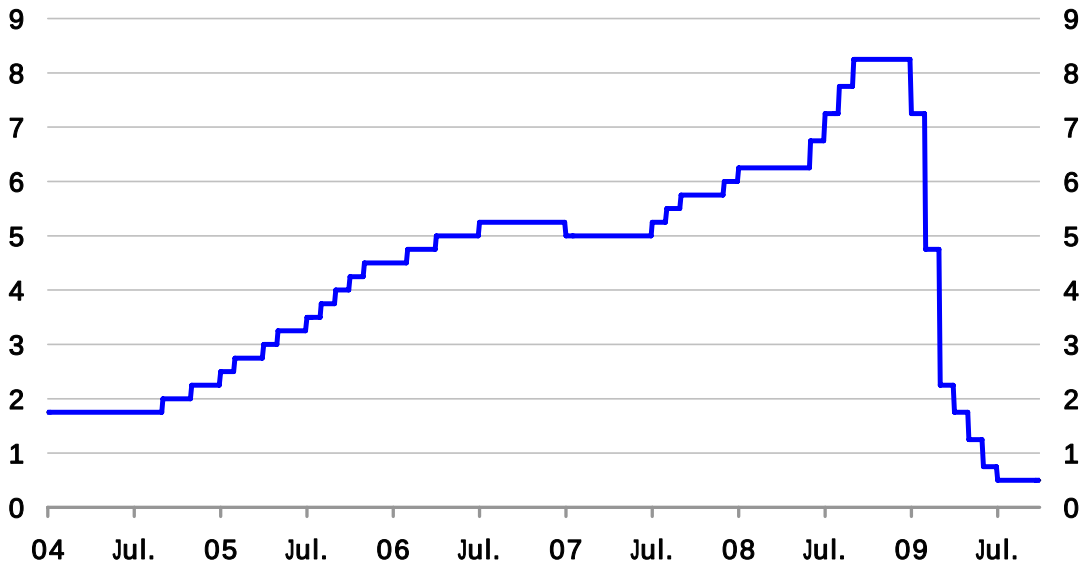
Sources: Statistics bureaus at each country and Bloomberg.

Figure 4
Inflation indicators



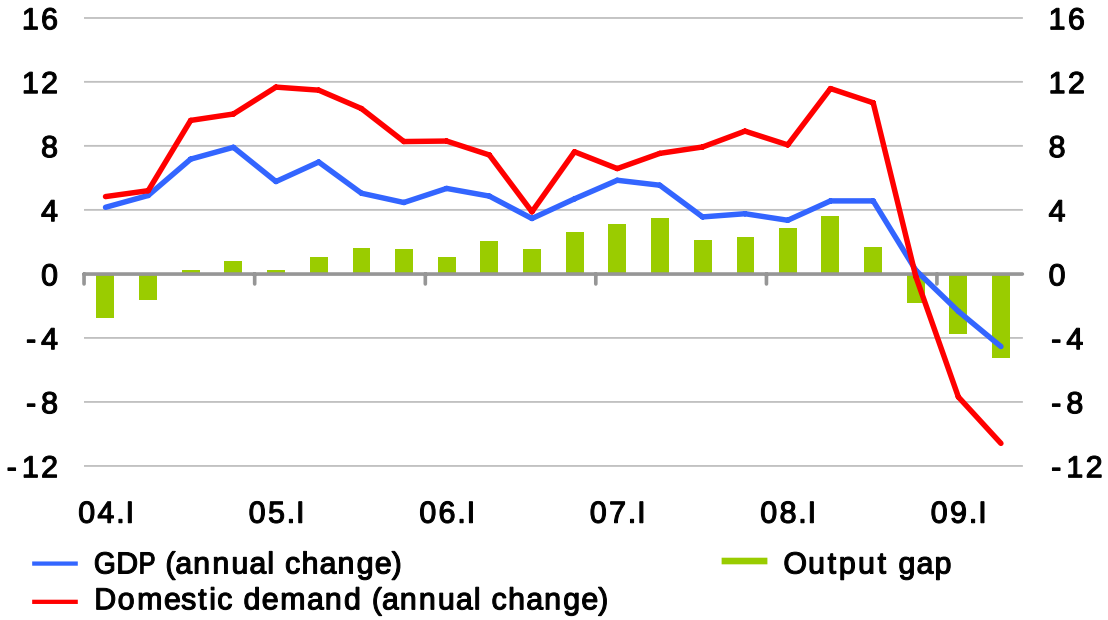
Sources: Central Bank of Chile and National Statistics Institute.

Figure 5
Monetary policy interest rate
(percentage)



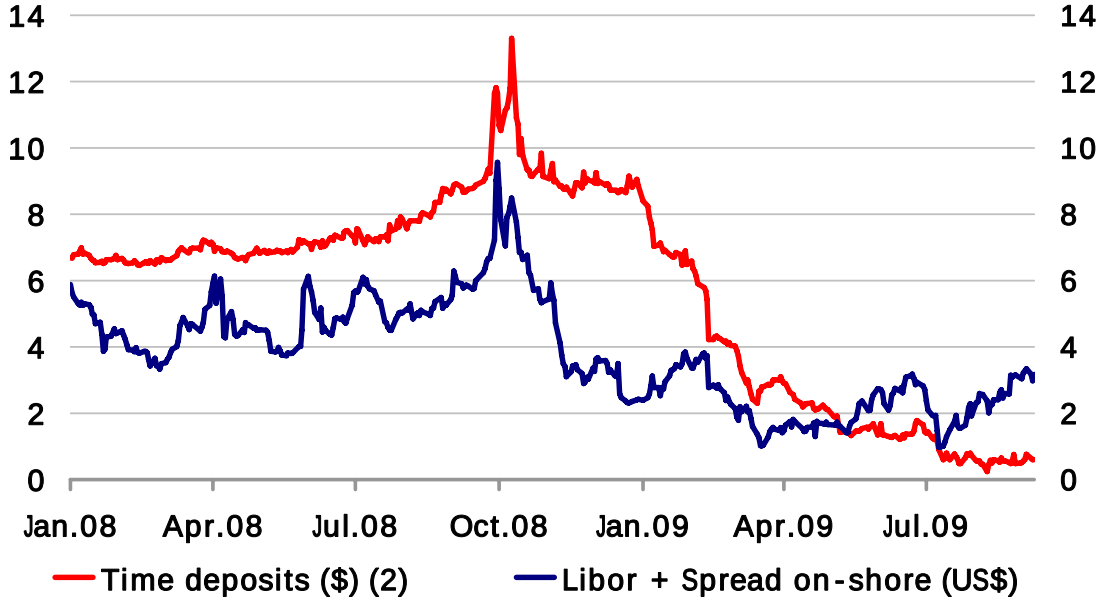
Source: Central Bank of Chile.

Figure 6
GDP, Domestic demand and Output gap
(percentage)



Source: Central Bank of Chile.

Figure 7
Domestic market rates in US$ and CLP (1)
(percentage)



(1) 90 days. (2) Traded on the Chilean Stock Market.

Sources: Bloomberg and Central Bank of Chile.