THE GREAT MODERATION AND THE RISK OF INFLATION: A VIEW FROM DEVELOPING COUNTRIES

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It is an honor to be a keynote speaker at this important gathering. Personally, this is a special meeting as I contributed, together with Barry Eichengreen, Takatoshi Ito, and Charles Wyplosz, to the writing of the first report for this series of conferences back in 1999. It was lots of fun and an intellectual pleasure to work with such a great team of colleagues, and in such an important issue. In that first Geneva Report we wrote about the need to reform the IMF giving it independence, such as what we praise for central banks, and accountability, an essential element to make independence effective. In the future I would like to develop further on those issues; however, today I will focus on an even more pressing debate in the recent macro juncture: monetary policy, stability and the current risks of an outburst of inflation around the world, which is precisely the subject of this conference.

I will first refer to the Great Moderation, an expression in use to describe the decline in output and inflation volatility of industrial countries in the last twenty years. There has been significant research on the factors behind this phenomenon, better monetary policy being one of them. I will argue that in developing countries the Great Moderation was achieved about ten years ago and coincidentally with the conquest of low inflation. The timing of events supports the hypothesis of a causal relationship from inflation control to decreased output and inflation volatility. Thus, improvements in monetary policy contribute to obtaining not only price stability but also output stability, or smoothed business cycles. I will argue that the long time that passed between the great moderation in industrial countries and developing ones, cast doubts on the validity and generality of hypotheses based on common positive shocks ("good luck"), such as the decline in oil prices and technological improvement (e.g., better inventory management).

The second issue I will address is the prospect for maintaining stability in a context of severe inflationary risks. Indeed, in the last quarters we have witnessed one of the largest inflationary shock in the post-World War II period. This is the biggest threat we have encountered to the impressive achievement of stable business cycles and low/stable inflation. Up to now, the shock has had enormous effects on the poor, as the prices of basic foodstuff have increased sharply. In addition, if inflation persists, the cost along the business cycle may become excruciating. I will close with some thoughts on the challenges ahead for monetary policy.

The Great Moderation

The substantial decline in macroeconomic volatility we have witnessed in the US and the world during the last decades has been widely documented by a substantial body of empirical research. Kim and Nelson (1999) and Blanchard and Simon (2001) were among the first to point at

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this phenomena which later became known as the Great Moderation. These latter authors found, for the US, that the variability of quarterly growth in real output had declined by half since the mid-1980s, while the variability of inflation had declined by about two thirds. Similar declines in the volatility of output and inflation occurred in most other G-7 countries roughly around the mid-eighties (Stock and Watson, 2003).

While we know that the control of inflation was achieved by the actions of monetary policy in the US, there is still an ongoing discussion regarding what caused the persistent decline in both output and inflation volatility. In general, the different reasons can be separated into three groups:

- The first argument is that the Great Moderation is the result of smaller and less frequent shocks hitting the economy. This would imply that the observed reduction in macroeconomic volatility would be the result of good fortune and would thus only last until bad luck or larger shocks were to re-appear. Several studies have provided support for the "good-luck hypothesis" (Ahmed, et al., 2002).

- A second related explanation is focused on structural and technological changes which are permanent in nature, but were not directly caused or controlled by macroeconomic policies. For example, a special type of technological progress frequently mentioned in the discussion of output volatility refers to the improved management of inventories. If a significant part of the business cycle dynamics occurs through inventory fluctuations, "just in time" technologies and better management of inventories in general would reduce volatility along the business cycle (McConnell and Perez-Quiroz, 2000; Cecchetti et al., 2005). Another important structural change is related to worldwide economic integration and globalization, as reviewed in the Geneva Report prepared for this conference (Gerlach et al., 2008). Cavallo (2007), for example, emphasizes that trade openness has reduced output volatility, and hence, more open economies are also more stable. This evidence refutes the old view that more open economies are more exposed to volatility. On the contrary, Cavallo (2007) argues that more open economies have more opportunities to adjust to international shocks. Following this argument, the notable increase in openness all around the world would make all countries more stable.[1]

- A third and final factor which I would like to emphasize is related to improved monetary policy. These reforms have resulted in the reduction of not only inflation levels, but also its volatility. Figure 1 shows average growth and inflation over an ample set of developing countries,[2] while figure 2 shows the volatility of output and inflation. It can be seen that volatility declined in developing economies towards the mid-nineties. This is almost a decade after the developed economies experienced their "Great Moderation". Thus, we can say that this evidence suggests there is a timing mismatch between the great moderation of developed and developing economies.

The "good luck" hypothesis and the explanations based on structural factors cannot properly account for this phenomenon. If volatility had fallen only due to good luck, then luck itself should have only been good for developed countries in the mid 1980s, which then took more than 10 years to arrive to help developing ones! Similarly, the argument of increased productivity,

[1] Kent et al. (2005) examine also the role of reforms in product and labor markets on output volatility for a sample of 20 OECD countries. For evidence in the case of Chile and estimations of reduced-form VARs, see Betancour et al. (2008).

[2] Seventy three economies classified as developing in the IFS data base and containing information since 1975.

such as better inventory management, has similar problems. It is difficult to think that businesses in developing countries adopted these better techniques more than 10 years later.[3]

However, reforms regarding monetary policy have lagged noticeably in their adoption among developing economies. Central bank independence, inflation targeting and other related policy reforms have only materialized in developing economies beginning in the mid-90s which coincides with the fall in volatility in this group of countries. While structural changes, such as the increased openness, may have indeed helped economies become more stable, these changes must also include those related to monetary policy because the Great Moderation coincides with inflation control, suggesting that improved monetary policy has indeed played a major role.

So, the relevant question is exactly how does monetary policy reduce the volatility of both output and inflation. We know that there is a tradeoff between output volatility and inflation variability, and monetary policy attempts to manage this tradeoff optimally. Policymakers have to decide how to reduce inflation to reach their goal. If they react forcefully to any inflation deviation, the outcome will be low inflation volatility, but large output volatility. Thus, in the long run, there is a tradeoff between inflation volatility and output volatility, although inflation has no effects on the full employment level of output.

It is also possible to practice inefficient monetary policy, one which lags behind the output/inflation volatility frontier, making both of these inefficiently large. Bernanke (2004) argues that in such a scenario of inefficient monetary policy, the volatility of both output and prices can be reduced by moving to better policies. In other words, in the presence of an inadequate monetary policy, the outcome could be excessive volatility of output and inflation, and, hence, moving to an efficient policy can "shift the tradeoff to the origin" between output and inflation volatility, reducing both of them. In other words, improvements in monetary management can allow reaching an efficient frontier.

For example, a monetary policy that reacts insufficiently to changes in inflation, without fulfilling the Taylor principle, or a policy too optimistic on the full employment level of output, could end up generating unnecessary volatility and inflation. These are reasonable explanations for the conduct of monetary policy in the US before the 1980s' disinflation. This policy inefficiencies could be even aggravated by a belief on a permanent unemployment/inflation tradeoff, leading potentially to Friedman's accelerationist hypothesis.

However, I want to emphasize the credibility bonus that comes with commitment to inflation stabilization. In a standard Phillips curve framework, inflation depends on the output gap (the reason for the output/inflation volatility tradeoff), inflation expectations, and a set of other variables including inflationary shocks. Let's consider the case of low credibility in a low inflation objective. In such a case, an inflationary shock may feedback into price and wage formation, requiring a more aggressive monetary policy response, and hence, making it costlier to reduce inflation. This could happen when expectations are not only forward looking, but have a high degree of inertia, due to, for example, high levels of indexation or lack of credibility. In contrast, when expectations are well-anchored to an inflation target, becoming also more forward looking,

[3] A similar point for the "good luck" hypothesis in the context of industrial countries has been made by Summers (2005). He argues that the decline in volatility of growth was not synchronized among industrial countries given the common decline in oil prices. Looking at developing countries makes this point even stronger, since it can also apply to inventory management and other forms of common productivity shocks since the asynchronicity is much more significant.

the monetary policy adjustment required to achieve stable and low inflation is milder and the sacrifice ratio declines, reducing the volatility of both inflation and output.[4]

Of course, achieving credibility is not an easy task and can be done through different avenues. Certainly the conquest of low inflation, as occurred in developing countries, increases the belief in policymakers' competence and commitment to controlled inflation. This allows stable inflationary expectations and reduces inflation persistence. An inflation target, with the necessary institutional support such as an independent central bank with a clear mandate to price stability, helps in this regard. It establishes an explicit commitment to keep inflation low and stable through time, and a strategy to adjust to deviations, including the time horizon in which this will be achieved. Indeed, among developing countries, those that adopted inflation targeting regimes have had lower inflation and output volatility than the rest (figure 3). Of course, this evidence is only suggestive and the direction of the causality could be the reverse, with more stable economies being more prone to implementing an inflation targeting regime. The empirical evidence on this subject is mixed, but generally it has been found that inflation targeting does lower inflation and reduce its volatility.[5] There is some evidence for emerging economies that inflation targeting also reduces growth volatility (Gonçalves and Salles, 2008).

Bad Luck is Back: The Risks of Inflation

Recently, the world has faced one of the worst inflationary shocks in the last 60 years. First, it happened with oil prices, which started rising sharply at the beginning of the decade, and has climbed to record-high levels (figure 4). However, even with this shock, inflation and output have been much less volatile than in previous oil price cycles. Lower oil-dependence and countercyclical fiscal policy explain part of the milder effects. Better monetary policy has also contributed to substantially reduce the impact of oil shocks on output and activity.[6] However, the price of oil has kept increasing, and although its effects are smaller than in the past, the shock is becoming so large and persistent that it may have noticeable effects on inflation and output over the coming quarters. On the bright side, however, the better monetary policy frameworks that are used today limit these effects.

On the other hand, more recently, we have seen an impressive increase in food prices (figure 5), with serious inflationary effects in many countries. Food prices have reached in some cases their highest levels in history. This is mainly due to increased demand from emerging markets (especially China, India and oil-exporting countries), the use of grains as biofuels, and some financial factors as investors have increased their long positions in commodities. Since mid-2006 grain prices, measured by the CRB index, have climbed at an annual rate of 56%, contrasting with the trend observed between 1990 and mid-2006, when prices increased around 0.5% per year. This is a common trend for other commodity prices. Wheat prices registered a reduction of around 1% between 1990 and mid-2006, and a rise of 121% since then, despite a partial reversion in the price during the last month. Similarly, rice prices, whose levels remained practically unchanged during 1990 and mid-2006, jumped to its peaks by increasing at annual rates of 71% since mid-2006.

[4] For a model on this issue see De Gregorio (2007).

[5] Truman (2003), Hyvonen (2004) and Vega and Winkelried (2005), among others. Ball and Sheridan (2005) show that the available evidence does not support this conclusion for developed economies. Mishkin and Schmidt-Hebbel (2007) corroborate this differentiated benefit, and conclude that the winners are emerging economies and converging-to-target ITers. Still, they conclude that the choice of the control group is key for finding any effect of IT on inflation.

[6] De Gregorio et al. (2007) and Blanchard and Gali (2007) show evidence supporting these views.

Finally, milk price, after falling at 0.3% per year during 1990-mid 2006, has increased at a 70% annual rate since then.

The first-round price effects of the shock have been felt in sharp increases in foodstuff and energy while the rest of prices remain well behaved (figure 6). For example, in Chile inflation hovers at about 8%, four points above the ceiling of our comfort zone (2 to 4%), mainly due to the rise in foodstuff and energy prices. Indeed, non-food non-energy inflation is still close to 3%. Foodstuff prices have increased further due to weather problems (frosts in 2007 and drought in 2008).

The nature of these price hikes is purely international, or related to weather, making them unavoidable from the point of view of monetary authorities. However, their potential propagation to other prices and wages through what we normally call second-round effects gives monetary policy an important role even in the presence of these specific external price shocks. Given the nature of the shock, driven to a large extent by biofuel production and food demand in fast-growing Asian countries, the shock is likely to persist for a long time. Some second-round effects are bound to happen, since price and wage formation always have some degree of inertia. The role of monetary policy is to ensure that the adjustment of relative prices occurs without a persistent increase in inflation, that is, beyond normal dynamics. Put differently, monetary policy must guarantee that the dynamic of prices is consistent with convergence of inflation to its objective, within the time horizon envisioned in the inflation target regime. That is, monetary policy must worry about, and act upon, unstable dynamics that can lead to increases in inflation that may later be too costly to contain. These are the undesired second-round effects that may require strong monetary policy actions.

In a flexible inflation targeting regime, once there are deviations from the target, monetary policy is implemented on the basis of bringing back inflation projection towards the targeted level within a given time horizon. In Chile, this would mean bringing down projected inflation to 3% in the two year horizon. This length of the horizon takes into account the lags in the effects of monetary policy, as well as the fact that bringing back inflation to target has an output cost. It also allows for transitory shocks to undo their effects without shifting the path of monetary policy. Therefore, in the current context of sharp inflationary pressures, monetary policy must avoid undesired second-round effects, which are those that generate an adjustment longer than the one envisioned in the policy horizon.

In order to monitor these potentially undesired second-round effects, we scrutinize price dynamics that appear to be out of the normal. For example, we follow the evolution of wages compared to an estimated evolution of wages based on the historical patterns of indexation. If wages are growing faster than these estimates, we could be facing worrisome wage dynamics that may require a policy reaction.

In this scenario, it could be argued that one could relax the policy horizon or the target level to accommodate these inflationary shocks with small output costs. However, based on my previous discussion, this could be very detrimental for the future. Giving up on inflation will lead to losing the inflation anchor on expectations, more backward- than forward-looking behavior of wage and price setters, and an increase in output volatility. In other words, we would be achieving an inefficient outcome for monetary policy and losing the benefits of the Great Moderation.

Hence, central banks must carefully monitor inflation expectations. However, in the current juncture of extreme uncertainty and inflation volatility, the breakeven measures that compare nominal and inflation protected securities appear to be excessively high world-wide, thus apparently

showing an important increase in inflation expectations, which could even reflect the loss of the nominal anchor. This has also been the case in Chile, especially since the deepness of the market of inflation protected instruments tends to make them the natural safe haven. Therefore, in uncertain times like the ones we are enduring today, breakeven measures may increase without necessarily implying un-anchoring expectations, making their timely recognition more intricate.

Some could incorrectly argue that a way to avoid the monetary policy reaction to some specific inflationary shocks is to focus inflation control on core rather than headline measures of inflation. This is a much debated issue, but in the context of the current discussion I would like to add that above the problem of doing the change in target in an opportunistic way and the impact it may have on credibility, there is a more profound reason why focusing on core versus headline inflation is not an issue in the current environment, where commodity prices have already increased substantially. In the present scenario, second-round effects appear in all prices. For example, a rapid increase in wages, due to backward looking indexation or other type of inertia, will affect all prices through the cost channel, and hence, a pernicious dynamic of inflation will be noticeable in both headline and core inflation. Indeed, a reasonable adjustment should have foodstuff and energy price inflation falling sharply after the relative price adjustment has taken place, and core inflation adjusting from a higher level to the target. Once food and energy prices level out, the propagation of inflation could be a more serious problem for countries that focus its target on core inflation.

Challenges to Monetary Policy

Current inflationary shocks pose a serious threat to monetary policy. The recent adjustment has been uneven across countries. Many have been trying to avoid the increase in prices via subsidies, taxes or plain price controls. However, it is by now clear that relative prices must adjust, given the persistency of the shock and the need for appropriate signals for efficient resource reallocation. On the other hand, there are countries, such as Chile, where changes in costs are regularly passed on to consumer prices, because markets for foodstuff are globally integrated and competitive. Hence, a large part of the inflationary shock has been already absorbed. However, we have continuously witnessed a flow of bad news on commodity prices, and inflationary shocks keep hitting us, but the benefits that the flexible inflation targeting regime brings in terms of price stability and credibility must be maintained. There is no doubt from the developing countries' perspective that this is an important conquest and cannot be abandoned, least of all in these difficult times.

The world economy is in a very complex situation. It is far from the disastrous 1970s, but we are in the presence of a slowdown with high risks of inflation. We are at a moment in which monetary policy is put under a serious stress test that will be crucial in identifying future refinements in the policy frameworks. Particularly important in the US and industrial countries is the interaction between price and financial stability. From a policymaker's point of view, we must ensure that all the benefits achieved during the great moderation phase are preserved. It would be irresponsible to return to times of instability while searching for short-lived gains.

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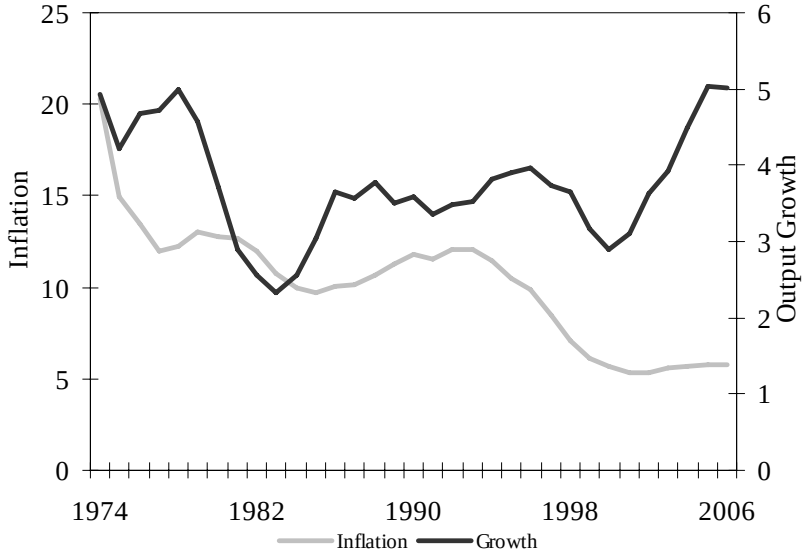
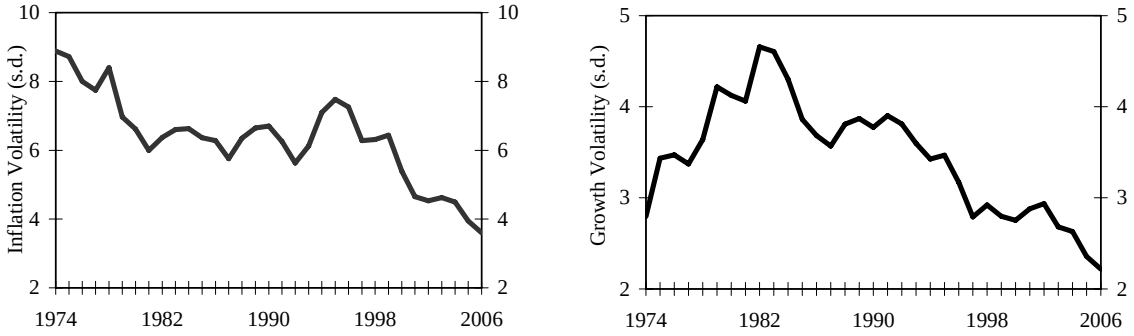
Figure 1: Growth and inflation in developing economies



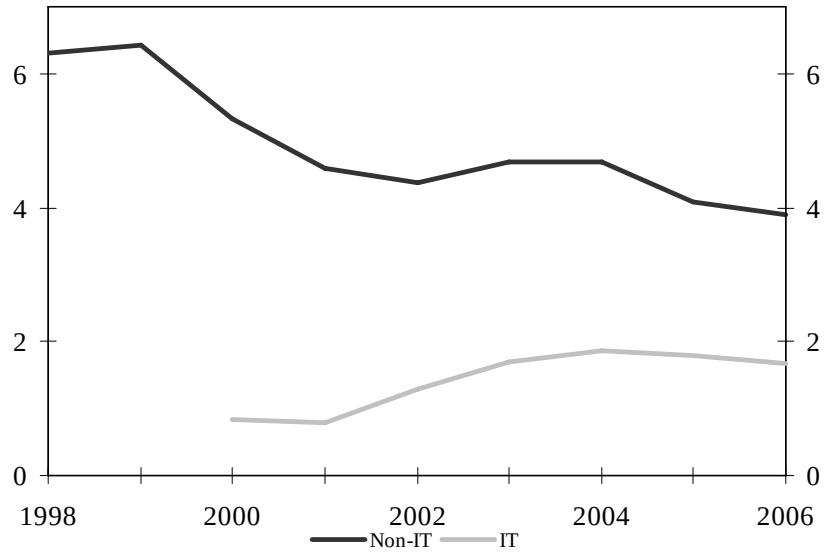
Note: Inflation was calculated using YoY \% change in consumer prices, given by IFS line 64. Growth was calculated as the YoY \% change in GDP volume as given by IFS line 99b. Averages are taken over all countries that have data available from 1975. Industrial and developing status of countries has been taken directly from IFS.
Source: IFS.

Figure 2: Inflation and output growth volatility in developing economies



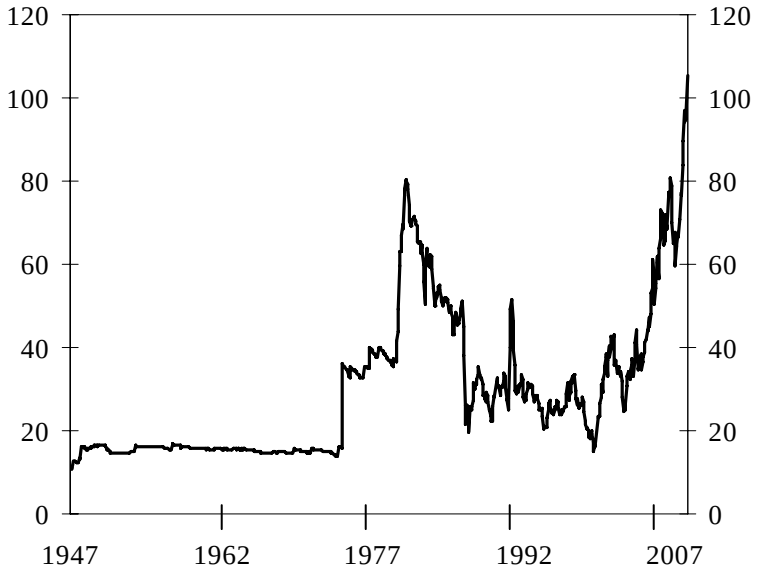
Note: Inflation and growth have been calculated as in figure 1 over the same country groups. Volatility is measured as the standard deviation, over a rolling window of five years.
Source: IFS.

Figure 3: Inflation volatility in developing economies: IT versus non IT



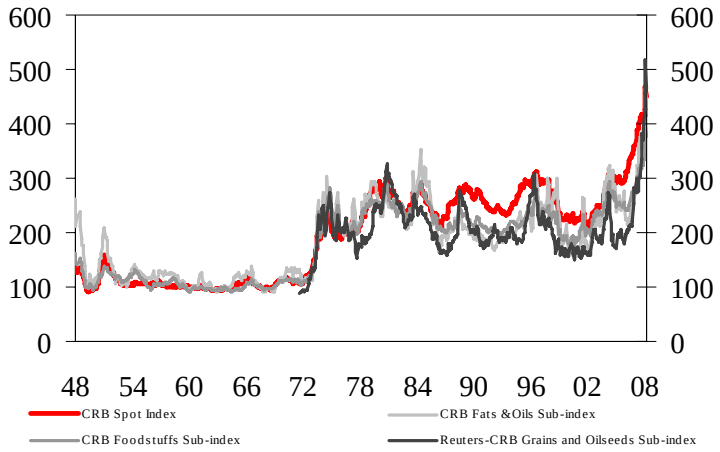
Note: Inflation has been calculated as in figure 1. Volatility is measured as the standard deviation, over a rolling window of five years. Countries were considered part of one group when more than 50% of the window corresponded to that group.
Source: IFS.

Figure 4: Real WTI oil price (US$ of February 2008 per barrel)



Note: Price deflated by US Producer Price Index.
Source: Bloomberg.

Figure 5: Food prices (index, January 2006 = 100)

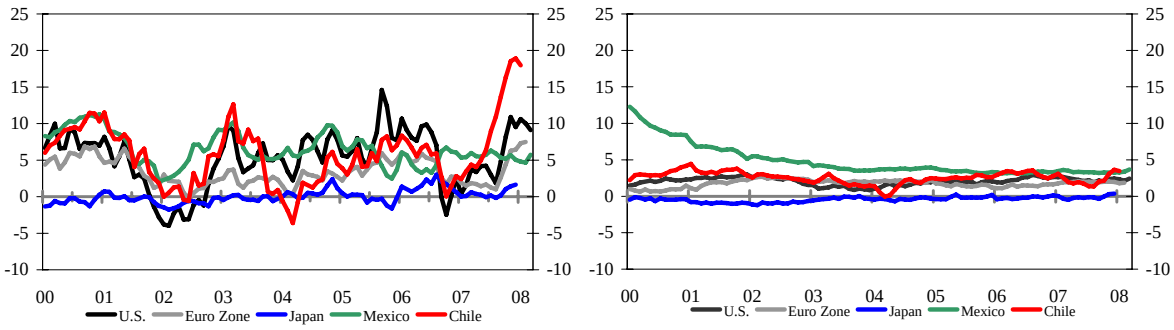


Sources: Commodity Research Bureau, Reuters and Bloomberg.

Figure 6: Inflation: Food, energy and rest (annual change, percent)

Food and energy

Non food and energy



Source: Central Banks and Bloomberg.