Inflation outlook

6

This chapter of *The Inflation Report* presents the Monetary Policy Committee's (Copom) assessment of the behavior of the Brazilian economy and of the international scenario since the release of the previous *Report* in June 2009. The chapter also presents the analysis of the inflation prospects up to the third quarter of 2011 and the Gross Domestic Product (GDP) growth up to the end of 2009. Inflation projections are presented in two major scenarios. The first scenario, called the baseline scenario, assumes that the Selic rate will remain unchanged at 8.75% per year over the forecasting horizon, a rate set by Copom at its most recent meeting, held on the 1st and the 2nd of September, and that the exchange rate will remain at R$1.85 per US dollar. The second scenario, called the market scenario, is based on the expected paths for the Selic rate and for the exchange rate drawn from the survey carried by the Central Bank's Investor Relations Group (Gerin) among independent private sector analysts. It is important to highlight that these scenarios are used only as guidelines for monetary policy decisions, and their assumptions are not part and should not be viewed as Copom's forecasts of the future behavior of interest and exchange rates. It should be noted that the projections released are based on the information available up to the cutoff date of September 11, 2009.

The projections for inflation and for GDP growth released in this *Report* are not point estimates. They consist of probability intervals which embody the degree of uncertainty that was present in the aforementioned cutoff date. Inflation projections depend not only on assumptions about the interest and exchange rates, but also on a set of assumptions on the behavior of exogenous variables. The most likely set of assumptions considered by the Copom is used to build the scenarios to which the Committee attaches the greatest weight on making its interest rate decisions. On setting out these assumptions, the Copom seeks to foster transparency to monetary policy, thereby contributing to the effectiveness of policy decisions in controlling inflation, which is its primary objective.

6.1 Inflation determinants

The twelve-month inflation, measured by the change in the Broad National Consumer Price Index (IPCA), after rising since the second half of 2007 and reaching 6.41% in October 2008, is receding slowly but consistently since then. It ended 2008 at 5.90%, which is 1.44 percentage points higher than the rate in 2007 (4.46%). Once it reached 4.36% in August, it moved to the lower limit of the target path. So far this year the IPCA has accumulated an inflation of 2.97%, a rate which is 1.52 percentage points lower than that observed in the same period last year. This dynamic was initially influenced by a decline in commodity prices in the second half of 2008 and, subsequently, by the slowing down of the domestic economy in the last quarter of 2008 and the first quarter of 2009. Both cases are a direct consequence of the international financial crisis. More recently, as it has been noted in the last years, there was a recovery – albeit partial – in the price of various commodities, but its impact on prices was somewhat offset by currency appreciation. Moreover, the change in services prices continues to show considerable persistence, partly as a result of the resilience displayed by the labor market.

In the year up to August, the accumulated change in regulated prices was 2.98%, and in market prices 2.97%. Within the set of market prices, stands out the price change for non-tradable goods (3.90%), much higher than that for tradable goods (1.94%). This phenomenon stems in large part from the asymmetric effects of the global economic crisis on the domestic economy. In fact, the most intense effects hit the industrial sector, while the services sector proved to be very resilient. The recent price dynamics continued to narrow the difference between the twelve-month inflation of market prices and of regulated prices, which fell from 6.21 percentage points in June 2008 to 0.69 percentage points in August 2009. In turn, as a sign of domestic demand resistance, inflation in the services sector has remained at a level well above the market prices and has been accelerating in comparison to 2008. In the current year up to August, the services sector inflation reached 5.08% (compared to 4.45% in the same period in 2008), while in twelve months it reached 7.04% (compared to 5.91% in the same period in 2008).

After two consecutive reductions – in the last quarter of 2008 (3.4%) and in the first quarter of 2009 (1.0%) – the GDP at market prices grew 1.9% in the second quarter of 2009, in comparison to the previous quarter, according to seasonally adjusted data by the Brazilian Institute of Geography and Statistics (IBGE). Nevertheless, when compared to the same period of 2008, GDP decreased 1.2%. Although the growth rate is still negative in an interannual comparison, its value in the second quarter clearly reflects a fast recovery of the Brazilian economy against the effects of the global economic crisis. From the production viewpoint, the industrial sector, after falling 8.0% in the fourth quarter of last year and 3.2% in the first quarter of the current year, recorded the highest growth rate (2.1%) among the three sectors in the second quarter, according to seasonally adjusted data by the IBGE. The performance of this sector, which was strongly affected by both the reduction in demand for durable goods and for investment goods, as well as by the fall in external demand, partly reflects the effects of fiscal stimuli and the initiatives to restore normality to the credit market. Moreover, the recent performance of the industrial sector suggests the end of the inventory cycle. Inventories were at high levels at the time of the rise of the global crisis, which contributed to a delayed recovery. The services sector – the one with the largest weight in GDP and which showed resilience during the crisis – grew 1.2% in the second quarter in relation to the first. In turn, the agricultural sector declined 0.1% over the same period. When compared to the same period of last year, it appears that the industrial and the agricultural sectors were at levels 7.9% and 4.2%, respectively, below those observed in 2008. In reverse, services were above 2.4%.

From the viewpoint of aggregate demand, the Gross Fixed Capital Formation (GFCF) maintained its level in the second quarter in comparison to the the first one, after having retreated 9.1% and 12.3% in the fourth quarter of 2008 and first quarter of 2009 respectively, according to seasonally adjusted IBGE data. Household consumption, by far the most important component of aggregate demand, increased 2.1% relative to the previous quarter, while government consumption declined 0.1%. Compared to the same period last year, while GFCF decreased 17%, the latter two expanded 3.2% and 2.2% respectively. In turn, the external sector contributed positively to GDP growth in the second quarter (0.7 percentage points), with imports decreasing by 16.5% (contribution of 2.3percentage points) and exports reducing by 11.4% (contribution of -1.6 percentage points). Although signs of global recovery are becoming clearer, it is reasonable to assume that this will occur at a slow rate in mature economies. Considering this and the prospect of a faster recovery in domestic activity, it is possible that in the upcoming quarters, the external sector will contribute less positively to GDP growth. In line with this assessment, Copom believes that the key factor for sustaining economic activity will continue to be domestic demand.

The resilience of domestic demand has become an element of stability of the Brazilian economy. Data from retail sales, which have disagreed with production data in recent months – partly due to the high inventory levels with which industry began the year – corroborate this assessment. In fact, retail sales recorded growth of 4.4% in the first half of the year, compared with the same period last year. Although there has been a deceleration compared to the strong pace of expansion seen in 2008 when it reached 9.1%, growth is still robust. On the other hand, the twelvemonth expansion decreased from 10.3% in September 2008, when the international crisis intensified, to 6.2% in June 2009. A prominent effect was the sharp increase in sales in the segment of "hypermarkets, food, beverage and tobacco", which reached 6.8% growth in the first six months of the year. Expanded retail sales, which include sectors more sensitive to credit conditions like "vehicles and motorcycles, parts and accessories" and "construction material", – have also shown resilience. They grew by 3.9% over the same period, despite a drop in car production, which primarily reflected the decline in external demand. Thus, the Committee assesses that, although retail sales are likely to show less momentum than in the recent past due to the removal of temporary incentives, they should continue to record positive results over the coming quarters.

The unemployment rate, which fell steadily over the past years (annual average of 10.0% in 2006, 9.3% in 2007 and 7.9% in 2008), increased in the first half of 2009. The rise in the unemployment rate reflected the effects of the economic slowdown, but it began to drop over the last two months. Indeed, after reaching the minimum of the new series in December 2008 (6.8%), unemployment rose to 9.0% in March, but dropped to 8.0% in July, when for the first time after four months, it eased back in comparison with the same period last year (-0.1 p.p.). In turn, there are no clear signs that the deterioration of the labor market has affected workers' incomes, which has been supported by the gradual reduction of inflation. According to the IBGE, the average real earnings usually received by the employed population, which increased 3.2% in 2007 and 3.4% in 2008, continues to rise solidly in 2009. In the twelve months through July, the increase reached 4.3%, 2.2 percentage points higher than the rate for the same period last year. On the other hand, the average number of persons working, which had grown 2.6% in 2007 and 3.4% in 2008, showed signs of cooling this year (0.8% until July). As a result, real payroll – an important driving factor of the aggregate demand in recent years – which had reached 5.8% in 2007 and 6.9% in 2008, dropped to 4.8% in the year to July. As a result, the expansion of real wages – an important factor driving aggregate demand in recent years – which had reached 5.8% in 2007 and 6.9% in 2008, dropped to 4.8% in the year to July. According to data from the National Confederation of Industry (CNI), the level of employment in the manufacturing industry, which had increased 3.6% in 2007 and 4.0% in 2008, fell 3.1% in 2009 up to July, clearly reflecting the sharp drop in industrial production seen in previous quarters. Concerning the evolution of formal employment, after intense falls at the end of last year and early this year, figures released by the Ministry of Labor and Employment (MTE) show a recovery in the creation of jobs. Early 2009 losses were reversed and, up to July, the figures from MTE showed the creation of 437.9 thousand formal jobs. It should also be pointed out that after several months of decline, the manufacturing industry showed in July a positive balance in the creation of jobs for the fourth consecutive month.

In addition to the rising payrolls, the availability of credit to households – encouraged by macroeconomic stability and institutional advances – came to constitute a fundamental element for the increase in private consumption in recent years. This channel has been badly damaged by the intensification of the global economic crisis, as financing conditions deteriorated sharply beginning in September 2008. Furthermore, the increase in macroeconomic uncertainty and a weakening labor market turned economic agents more reluctant to borrow. This scenario changed significantly since the last *Report*. In addition to increased credit supply, especially via public banks, private companies have returned to raising funds, abroad or through capital markets, which are channels that were blocked after September. On top of that, with a significant fall in the benchmark interest rate, seldom used channels have become slightly more attractive (for example, debentures). Compared to the same month last year, July's stock of credit to households with non-earmarked resources from the financial system grew 19.7% (24.2% in December 2008), with special emphasis to the expansion of leasing operations (33.5% versus 88.2% in December 2008). It should be noted that this expansion of credit has been accompanied by a modest rise in delinquency. The expectations of market analysts and representatives of the banking sector indicate that, although the volume of credit should slow down when compared to 2008, it will continue to expand in coming quarters.

Investment, which until the third quarter of 2008 was shaping up as the most dynamic component of domestic demand, actually showed the biggest contraction in the two quarters following the upsurge in the global economic crisis, in line with the typical behavior of this variable in episodes of cyclical reversion. The worsening of the global financial crisis led to some firms' revaluation of their investment plans, either because of the worsening demand outlook or because of the deterioration in financing conditions. Another relevant constraint was the exchange rate depreciation recorded in the last quarter of 2008, which caused increases in the cost of imported capital goods. Indeed, the accumulated decline in GFCF in the last quarter of 2008 and the first quarter of 2009 reached 20.3%, according to seasonally adjusted data, while household consumption fell by 0.8% and government expenditure increased 1.1% over the same period. Even though the environment for investment inspired some caution, the second-quarter GDP, which shows stability of investment in comparison with the previous quarter, along with industrial recovery and fall in inventories, suggests that the contraction phase had ended. In this context, the Copom considers that the scenario for investments is one of growth in the coming quarters, although the speed of recovery may be modest at first.

The volume of credit with non-earmarked resources to corporations grew by 12.8% in July (38.9% in December 2008) compared to the same month of the previous year. The capital market, adversely affected by the intensification of the global economic crisis, began to return to normalcy. On one hand, its recovery is related to the recovery of the economy as a whole and, thus, a decrease in the degree of risk aversion of entrepreneurs. On the other hand, it is due to the strong recovery in stock prices in 2009, contributing to reduce the cost of capital. Indeed, there are signs that companies will soon return to utilizing this funding channel. Despite the fatc that until August 2009 there have only been one initial public offering (R$8.4 billion in the secondary market) many companies have notified their intention to raise funds in the short term. In turn, the bond issuance (excluding issues by leasing companies), after reaching R$6.3 billion in 2008, arrived at R$7.2 billion between January and July 2009. Disbursements of loans and financing with resources from the Brazilian Development Bank (BNDES) amounted to R$74.1 billion in the first seven months of the year, a 66.2% higher volume than the one for the same period in 2008.

Regarding the external sector, after recording a surplus of US$40 billion in 2007 and US$24.8 billion in 2008, the trade balance reached US$20 billion up to August, which is 18.0% over the same period last year. This result was beyond the prevailing expectations at the beginning of the year. Indeed, the trade surplus in 2009 tends to be higher than the one for last year, even with the falling price of major products of our export basket. Despite the increase in the balance of trade, both imports and exports showed substantial decreases for the year. After reaching a record US$197.9 billion in 2008 (a 23.2% increase over 2007), exports reached US$97.9 billion in the first eight months of the year, a figure 25.2% lower than the one observed in the same period last year. Likewise, after a record high of US$173.1 billion in 2008 (an increase of 43.5% over 2007), imports dropped to US$77.9 billion through August, falling 31.6% over the one observed for the same period last year. Thus, the effects of the global economic crisis on the global flow of trade – both by the lower level of global economic activity and a fall in prices, especially of commodities – allow for an anticipation for a decrease in the volume of exports in 2009 – which had not occured since 1999 – as well as imports.

Even after decreasing 2.5% in 2008, the quantum of exports fell by 12.6% in July, clearly reflecting a slowdown in external demand. Moreover, after increasing 26.3% in 2008, the average price of exports declined 13.0% through July and did not compensate for a fall in export quantities as had happened last year. In turn, after growing 17.7% in 2008, the quantum of imports contracted 22.8% in July, sharply reflecting the slowdown of the domestic activity. Moreover, after a strong increase of 22.0% in 2008, the price of imports reduced 9.6% up to July.

Signs of stabilization in the global economy, which began to appear at the time of the release of the last *Report*, have intensified since then as financial markets around the world began to return to normalcy – especially the credit channel. Besides that, the effects of many measures of economic stimulus began to be evident, though unevenly, among the economies, especially in mature ones. In addition, several emerging countries, including Brazil, have begun to show recovery of the economic activity at a speed and magnitude greater than expected. These facts were reflected in commodity prices, which had showed a recovery in 2009, particularly oil prices, which recently overcame the US$75 barrier. The improved economic scenario and the consequent reduction in global risk aversion were also reflected in the valuation of emerging countries currencies. Moreover, as signs of a return to normalcy accumulate, concerns about an exit strategy emerge, specifically in relation to the reversal of monetary and fiscal stimuli. Note, however, that despite the improvements mentioned above, several structural problems in the international financial system persist. In short, the outlook for the global economy has improved significantly since the publication of the last *Report*, and it is expected that the current benign dynamics will continue, possibly intensifying over the coming quarters, even though there is still uncertainty about the pace of recovery, which tends to be gradual.

The current account deficit, which stood at 1.8% of GDP in 2008 (US$28.2 billion), reached US$8.7 billion up to July and fell to 1.3% of GDP (1.3% in twelve months), contrary to pessimistic forecasts. It is worth mentioning that this deficit was fully financed by net inflows of direct foreign investments, which amounted to US$14.0 billion through July, corresponding to 2.1% of GDP (2.9% in twelve months).

Regarding the aggregate supply, after registering strong decreases in the fourth quarter of 2008 (8.0%) and in the first quarter of 2009 (3.2%), the industrial sector expanded in the second quarter (2.1%) compared to the previous quarter, according to seasonally adjusted data from IBGE. However, the agricultural sector recorded a fourth consecutive decline in this comparison basis with a drop of 4.9%. Finally, after a modest contraction of 0.5% in the last quarter of last year, the services sector showed a second consecutive increase in the second quarter of this year, when it grew 1.2% after rising 0.6% in the first quarter. When compared to the same period last year, the respective changes were -8.0%, -4.2% and 2.4%, showing the resilience of the services sector in response to the global economic crisis.

Industrial production suffered a strong decrease caused by the intensification of the global economic crisis in September 2008. After growing by 6.4% up to September 2008 compared to the same period last year, industrial production shrank sharply in the last two months of last year (-7.3% in November and -12.5% in December) relative to the previous month, according to seasonally adjusted data, resulting in an expansion of just 3.1% in 2008. Thus, although it has been growing since January, industrial production is still at levels below those recorded in the same period last year. Indeed, until July, industrial production decreased 12.8% from the same period last year. The decline was equally severe in both the manufacturing industry (-12.8%) and in the mining industry (-13.2%). It should be noted, however, that the industrial sectors most dependent on credit, such as the automotive and the construction ones, which were hardest hit by the global economic crisis, showed recovery, in part because of the effects of countercyclical measures implemented by the government, as the a reduction of the tax on manufactured products (IPI) over the white line and cars, as well as the normalization of credit conditions in the economy.

On the demand side, GDP – discounting the change in inventories – shrank 0.1% in the second quarter of 2009 over the same quarter last year, with the external sector showing a positive contribution of 0.7 percentage points. After positioning below 100 in August 2008 – implying that the number of companies who rated their inventories as excessive surpassed those which assessed them as insufficient – the inventory level indicator from the Manufacturing Industry Survey of Fundação Getulio Vargas (FGV) fell further to 81 in December and, in January, attained its lowest level since July 2003. Since then, it increased again and reached 97 points in August 2009, indicating that the process of adjusting the level of inventories is in the final stage. The excess in inventories that occurred in the months following the upsurge in the global economic crisis was a major determinant of both the lack of momentum in the industry in the first semester, as well as of the recent discrepancy between the dynamics of production and sales. Thus, it is expected that the growth of industrial production will gain strength in the coming months, with positive effects on employment and income levels.

After reaching 86.7% in June last year, the seasonally adjusted monthly Installed Capacity Utilization Level (Nuci) calculated by FGV, retreated 9.1 percentage points and reached 77.6% in February. Recently it increased again, moving up to 81.3% in August, the sixth consecutive monthly increase. Even so, August's level is 5.0 percentage points below that of the same period last year, becoming the eleventh decline in this comparison basis. Concerning capacity expansion, the accumulated absorption of capital goods for the year, after reaching 22.2% in September 2008, dropped to 17.7% in December. The reversal observed at the end of last year has intensified in the early months of 2009. Indeed, until July there was a strong contraction (19.8%) in the absorption of capital goods, in line with a fall of 9.0% in imports of capital goods and of 23.1% in the production of these goods. It should be noted that on the same basis of comparison, the production of inputs for construction also dropped sharply (-10.2%). Despite the significant increase of idle capacity in the inter-annual comparison, recent indicators of industrial production, in conjunction with retail sales figures, suggest strong recovery in manufacturing activity. According to seasonally adjusted data, the indicator of overall demand level from the Manufacturing Industry Survey of FGV, after moving from a level of 116.6 in September 2008 to 66.6 in December, stood above 100 in August this year (105.6), thus, indicating that the perception of expanding demand is higher than the perception of contracting demand.

With the intensification of the global crisis, the National Cost of Construction Index (INCC-DI) began to flash signs of a cooling down after a long period of price acceleration in the construction sector. In three of the last six months the INCC recorded monthly deflation. Thus, after peaking in November (12.34%), the twelve-month variation of the INCC moved to 5.10% in August, which was 6.29 percentage points below the level in the same period last year. Incidentally, since November 1998, monthly declines of this indicator have not been seen and, despite significant recent reductions, the scenario in the medium term remains uncertain, as there may be a recovery in the price of key raw materials used in the construction sector.

After two consecutive years of reduction (from 10.0% in 2006 to 9.3% in 2007 and then to 7.9% in 2008) the average unemployment rate rose to 8.5% in the first seven months of the year, which is 0.3 percentage points higher than that observed in the same period last year. Still, attention should be drawn to the fact that the consequences of the global economic crisis on the labor market are clearer when considering the figures of formal employment and the statistics of manufacturing employment, because to some extent the rise in unemployment was mitigated by the granting of collective holidays, reduction of working hours and other emergency measures, beyond the discouragement effect. Moreover, the recent recovery of economic activity has been accompanied by improvements in the labor market indicators and, in addition, the prospects for the coming quarters indicate the continuity of this dynamic recovery.

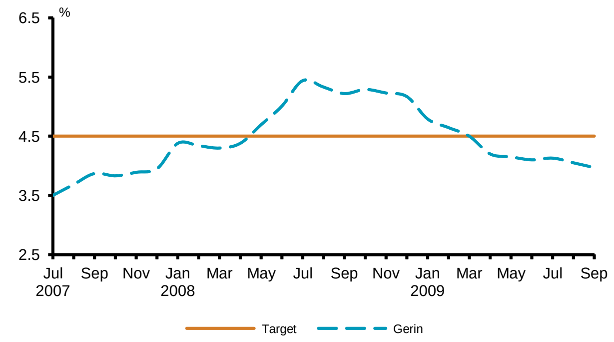
Despite the marked recovery in oil prices – a systematic source of uncertainty stemming from the international scene – they are at levels well below those recorded before the worsening of the international financial crisis. Indeed, after reaching nearly US$150/barrel in mid 2008, the price of oil has backed down to levels around US$40/barrel, but recently reached more than US$75/barrel. At first, this recovery reflected the reduction in macroeconomic uncertainties, i.e. evaluations that the worst of the financial crisis had passed. In the second phase, it was due to the evidence of economic recovery, especially in important emerging economies. Despite the significant uncertainties inherent in predictions about the path of oil prices, the main scenario adopted by Copom remains plausible, which forecasts domestic gasoline prices unchanged for the remainder of 2009. It's also important to note that the influence of international oil prices on domestic inflation is not transmitted exclusively by fuel prices at the pump, but also through channels like the productive chain of the petrochemical industry and the expectations of consumers and entrepreneurs. It is also appropriate to mention that, as had happened with the price of oil since the beginning of the year, the prices of agricultural commodities like soybeans, wheat and maize, have shown consistent recovery, albeit at different intensities.

After more than doubling in 2007 (7.89% versus 3.79% in 2006) and continuing to rise in 2008, when it reached 9.10%, broad inflation measured by the General Price Index (IGP-DI) slowed considerably in 2009. The twelve-month inflation was positive at 14.81% in July 2008, shifted to negative in July 2009 and reached -0.53% in August, which is 13.36 percentage points lower than in the same month last year. The IGP-DI's fall mainly reflected the behavior of the wholesale price index (IPA-DI), whose change in twelve months shifted from an inflation rate of 18.91% in July 2008 to a deflation of 3.25% in August this year. This movement is partly due to the recent appreciation of the real. As noted previously, the decrease in the price of construction goods that are part of the INCC basket also exerted significant deflationary pressure on the IGP-DI. In turn, the deceleration in consumer prices, according to the changes in the IPC-Br, was more restrained, although important, with inflation moving from 6.27% in November 2008 to 4.73% in August 2009. The significant slowdown in the IPA-DI was partly caused by the change in the behavior of agricultural prices, whose change in twelve months rose from an inflation rate of 37.91% in June 2008 to a deflation of 3.43% in August. Meanwhile, industrial prices, which accelerated during most of 2008, also declined, but less intensely. Indeed, the variation in twelve months has gone from an inflation of 15.41% in October 2008 to a deflation of 3.17% in August this year. As highlighted in previous *Report*s, Copom evaluates that the effects of the behavior of wholesale prices on consumer inflation will depend upon current and prospective demand conditions and upon expectations of price-setters regarding the future path of inflation.

The rise in consumer inflation that had been occurring since mid-2007 and intensified in 2008 has reversed in recent quarters. Even the initial fears regarding the magnitude of the pass-through to prices of final goods and services of the exchange rate depreciationthat occurred in the last quarter of 2008 was not confirmed. Strictly speaking, both the sharp decline in commodity prices and in the level of activity more than offset the inflationary potential contained in the exchange rate depreciation, while the stance of monetary policy helped to halt the deterioration of inflation expectations. Specifically in the most recent period, while the prices of commodities have shown recovery, the reversal of depreciation of the exchange rate allows one to infer that certain compensation between potential deflationary and inflationary pressures are arising from movements in these prices. In any event, the Committee reaffirms that it will continue to conduct its actions to ensure that the gains achieved in reducing inflation in recent years become permanent.

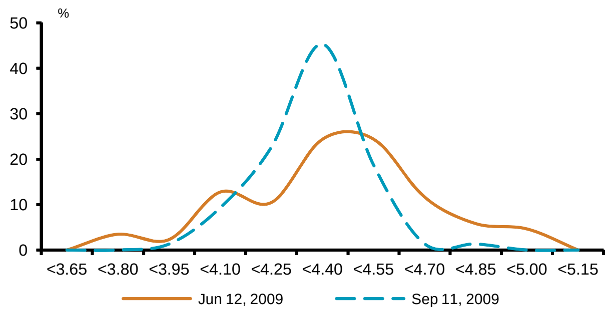
Like headline inflation, the three measures of core inflation calculated by the Central Bank show a reduction in the twelve-month accumulated indices, although in a more modest intensity. The core measure that excludes regulated items and food delivered at home recorded an inflation of 5.32% in twelve months up to August, compared to 5.86% in the same month last year (down only 0.53 percentage points). In turn, in the same period the variation of the cores by trimmed mean with and without smoothing of pre-established items declined, respectively, 4.85% and 4.92% to 4.38% and 3.65% (reductions of 0.48 percentage points and 1.27 percentage points, respectively). As expected, the core measures have shown more persistence than the headline inflation, yet in the case of the latter two, they are below the inflation target.

Figure 6.1 – Inflation target path and market expectations for twelve-month ahead inflation



The expectations for inflation have shown relative stability since the release of the latest *Report*. On the cutoff date of September 11, they were at 4.30%, 4.35% and 4.50% respectively for 2009, 2010 and 2011; compared to 4.39%, 4.30% and 4.50% on June 12. In general, since the release of the last *Report* there was a decline in dispersion around the central tendency measures of inflation expectations. Figure 6.2 shows that specifically for 2009, which, besides the typical pattern of convergence throughout the calendar year, confirms the evaluation that the prospective outlook for inflation was markedly less uncertain since the release of the latest *Report*.

Figure 6.2 – Dispersion of inflation expectations for 2009
Relative frequency



6.2 Main scenario: associated risks and monetary policy implementation

The projections used by the Copom are based on a set of assumptions about the behavior of the main macroeconomic variables. This set of assumptions, as well as the risks associated with them, comprise the main prospective scenario based on which the Committee makes policy decisions. On the whole, the prospective scenario, embodied in the projections to be presented in the next section, envisages, on the external side, improvements in the medium-term outlook of the global economic activity. On the domestic side, the prospective scenario involves continued recovery in economic activity, within a still benign scenario for inflation.

From the standpoint of the balance of risks related to the inflation outlook, the main risks arise from the intensity with which the recovery of domestic economic activity will take place and from the performance of institutional mechanisms that inhibit a more intense inflation response to a higher idleness of resources in the economy. On the external side, the main risk is associated with the persistence of the effects of the international financial crisis and the speed of the recovery of the global economic activity. From another perspective, a risk to be monitored is connected to the possibility that the cumulative and lagged effects of the monetary and fiscal easing implemented this year reach maximum intensity in a moment when the idleness level of factors is less significant.

The external environment includes, in the medium term, a more robust improvement in the global economic activity, and in the short term, a more restrained progress. Unlike the context of the last *Report*, there are now indications that the recovery of the economic activity would be starting, an assessment that gains support from the improvement in market expectations for overall economic activity. Despite recent improvements, the external environment also includes economic contraction for the aggregate of 2009, with recovery only in 2010. Indeed, the consensus projections for 2009 are for a contraction in activity in the US, Europe and Japan (the G3), which would not be totally offset by the economic momentum of some emerging economies, especially in Asia. However, there is evidence that economic activity in G3 would be stabilizing, with signs of improvement in industrial activity and in the US housing market, coupled with the recovery in manufacturing activity and corporate confidence in Germany and the industrial recovery in Japan. But there remains the risk that the international financial system's problems are compounded by the cyclical deterioration in credit quality, focused on the US and Europe, which could contain the easing of financial conditions and therefore hamper the consolidation of the recovery. In the mature economies, where the anchoring of inflation expectations is stronger and economic activity has weakened considerably and for a longer time, inflationary pressures reduced rapidly. In emerging economies, the deflation process has also occurred, in spite of greater inflation persistence. In this context, after a period of aggressive easing, the monetary policy in a significant number of countries seems to have entered a stability phase; while the increase in public sector indebtedness imposes limits on additional fiscal incentives.

There is still considerable uncertainty about the speed and magnitude of the global economic recovery glimpsed ahead. Two alternative scenarios should be considered. In the first case, economic activity remains stable or shows a modest recovery that extends throughout the year 2010, so that the contractionary effects and repercussions on the domestic economy would last throughout the inflation forecast horizon. In the second case, the recovery occurs more quickly than anticipated, with restoration of the financial conditions and confidence, associated with the recovery of commodity prices, possibly with greater risk of inflation. Given the resilience of activity in large emerging economies, especially in Asia, as well as the return of appetite for risk in international financial markets and the more positive signs of activity within the G3, the probability of this second scenario to materialize has increased since the disclosure of the previous *Report*.

As highlighted in recent *Reports*, the effects of the global crisis on the Brazilian inflation had, *a priori*, an ambiguous signal. However, the net effect has subsequently been shown to be mostly benign, with the effects tied to the reduced demand and commodity prices overlapping the impacts of the sharp exchange rate depreciation that occurred in the months following the worsening of the world crisis. More recently, despite the recovery in commodity prices, pressures on consumer prices derived from them have up until now been somewhat offset by exchange rate appreciation.

With regard to commodity prices, the relatively widespread upward movement in the second quarter this year was followed by a mixed trend in the current quarter. The future path of these prices, however, remains shrouded in much uncertainty as it depends on, among other things, the confirmation of the recovery of economic activity in mature economies, the speed of this recovery and the reaction of the most important emerging economies. In any respect, the most common perception points to a greater probability of increase than stability in these prices, especially in the medium term. It should be noted, however, that the analysis of the possible inflationary effects of the recent trend in prices of raw materials should not be divorced from the analysis of the effects that this movement has on the prices of Brazilian assets.

The movement of the exchange rate last quarter confirmed the shift in the framework highlighted in the last *Report*. Although the exchange rate is still well above the values observed before the worsening of the global crisisin

September last year, most of the depreciation in recent months of 2008 was reversed. The low pass-through of depreciation to consumer prices confirmed the analysis made in recent *Reports*, which outlined several factors that contribute to reduced transmission from exchange rate depreciation to prices. Listed, for example, was the institutional consolidation of the inflation targeting regime, the drop in commodity prices foreign currency, the contraction of domestic economic activity, the initial conditions in terms of real effective exchange rate and the previous exchange rate appreciation.

Currently, the main domestic risk factors, as noted earlier, are related to the intensity of activity recovery, the resistance to inflation and the cumulative and lagged effects of the easing of monetary conditions and of the fiscal impulses. The first element may be realized as both an inflation factor in a scenario of accelerated recovery, and as a disinflation factor in case the recovery shows cooling, while the other two appear as inflationary risks.

The behavior of GDP in the second quarter confirms the assessment contained in the last *Report*, which indicated the existence of signs of recovery. In fact, the fall in GDP in the first quarter on a lower intensity than the market analysts expected and the magnitude of growth in the second quarter have contributed to (upward) revisions of growth forecasts for both 2009 and 2010. Data from the second quarter confirmed the resilience of household consumption, the cessation of the downward trend in GFCF and the return on export growth. Thus, the two components of aggregate demand more strongly affected by the crisis (investment and exports) are already showing a more favorable performance.

The prospect of a continued recovery of the economy is essentially based on three elements. First, in contrast to what happened in previous shocks, even of less intensity, there was no disruption in the balance of payments, nor was there a financial crisis in the public sector, high inflation, or distrust of a regime change. In short, as pointed out on several occasions, the Brazilian economy is more resilient to external shocks. Secondly, the actions of monetary policy – notwithstanding the commitment to inflation targeting – and tax incentives – without jeopardizing the sustainability of the debt/GDP ratio – will still contribute to the resumption of economic activity. Thirdly, and perhaps most importantly, consumption, the largest portion of aggregate demand, has proven resilient, reflecting the decline in inflation and the better than expected performance of the labor market. Also, the confidence of consumers and entrepreneurs, who were already recovering in the past quarter, tend to have a more significant improvement.

However, while uncertainty about the projections of economic growth has reduced, the pace of the economic recovery remains unclear. For example, there are uncertainties about the behavior of investments, because, despite the improved climate of confidence, levels of capacity utilization are still low, although moving upward. The behavior of exports will depend directly on the pace of global economic recovery, although the most dynamic emerging economies are playing an important role. Consumption, in turn, should be benefited by the improvement in credit conditions and by positive signals coming from the labor market, but in contrast, withdrawal of tax incentives should act as a buffer. Since, so far, the resumption of credit expansion has been led by the public sector banks, it's possible that initiatives on the part of private banks towards regaining their market share will lead to stronger growth in credit, with positive outcomes on household consumption and, in general, on economic activity.

The Copom considers that there are still important mechanisms of resistance to a decrease of inflation in Brazil. There are mechanisms of price adjustment that contribute to lengthen inflationary pressures observed in the past, as evidenced by the behavior of the prices of services and some items in the basket of regulated goods since the beginning of the year. In fact, despite the economic downturn, prices of services grew by 5.08% in the first eight months of the year (7.04% in twelve months) compared to 4.45% in the same period in 2008, during which the economy was rapidly expanding. It is well known that the presence of price indexation mechanisms, even if informal, reduce the sensitivity of inflation to fluctuations in demand. The risk is that, despite the levels of economic idleness, these indexation mechanisms will eventually outweigh the mechanisms of containment of prices linked to demand conditions. By containing the deflation of the economy, indexation could raise the "starting point" of the inflation rate in a cycle of economic recovery, thus contributing to raising the risks to the prospective inflationary scenario.

In a medium-term perspective, however, the greatest risk to the inflationary path comes from the cumulative and lagged effects of the easing of financial conditions and fiscal impulses on the development of domestic demand in a context of gradual resumption of the utilization of production factors. The Selic rate reached a historic low (8.75% per year), with a cumulative reduction in the present cycle of 500 basis points.

A relevant part of the effects of further distension of financial conditions will materialize over the next few quarters (see box "The Transmission Gap of Monetary Policy to Prices" from the previous *Report*). Similarly, part of the effects of the fiscal expansion that had already occurred still has yet to materialize. In this context, existing uncertainties regarding the magnitude and lag of the transmission mechanisms of monetary policy tend to be more pronounced. In any event, in the medium term, the outlook is that a portion of the above effects will reach the prices possibly when the degree of idleness of the production factors will be lower than the current one, considering the recent course of indicators of capacity utilization and labor market.

On the fiscal side, uncertainty over the behavior of the GDP translates into uncertainty about future tax revenues in a context of rigidities in government spending, which is transmitted to the development of the primary surplus of the consolidated public sector. Even so, the Copom assesses, with information available so far, that if primary surpluses are enhanced in the coming years, there shouldn't be a significant and consistent change-over of the downward trend in the debt-to-GDP ratio.

As noted in the last *Report*, the Brazilian economy faced a period of contraction as a result of the global crisis, but that did not cause any disruption or change in the economic policy regime, as had occurred, for example, in early 1999. The basic framework of economic policy, based on the tripod of inflation targeting, fiscal adjustment and floating exchange rate, is consolidated and combines resilience and flexibility. Besides that, the strong external financial position, with significant volumes of international reserves, the trade surpluses and the external financing based mainly on direct investment were essential to overcome the turbulence without disruption.

By breaking the IPCA down into market prices and regulated prices, note that in 2009 the latter will probably also help to contain inflationary pressures, as seen in the last two years. In fact, the main scenario includes changes in regulated prices at lower levels than the market prices. Due to the decline in wholesale prices during much of this year and the prospect that these prices will remain contained until late this year, the scenario for regulated prices in the medium term is relatively benign. In particular, with respect to domestic prices of gasoline, because of the existence of a certain margin in relation to those practiced in the international market, the increase of prices in the short and medium term are apparently limited.

The last *Inflation Report* pointed to the risks of an intensification of the labor market retraction. However, recent figures show positive signs in this market, whose tendency now is of improvement, in line with the prospects of recovery of the domestic economy. The economic downturn has had important effects on the labor market, but they were shown to be of lesser magnitude and distribution, when compared with the drop in activity. Two factors may have contributed to this behavior: i) decline in activity mostly concentrated in industry, while sectors that employ a lot of manpower, such as services, were somehow spared; and ii) the short period of shrinking activity and the current positive outlook for economic growth (the level of employment tends to react with a certain lag to the production level).

The improvement in the credit market has intensified since the release of the last *Report*. The average bank spreads returned to levels close to those before the worsening of the global crisis, the interest rates in transactions for both individuals and corporations are at lower levels and the extension of credit is at similar levels. Foreign credit has also been normalized. Thus, the main scenario envisages a continued recovery of the domestic and foreign credit markets.

The possibility that unexpected changes in the inflation dynamics may have an effect on agents' expectations about the inflationary path in the medium and long terms is a persistent risk for the implementation of monetary policy and therefore deserves continued monitoring. In principle, concentrated short-term impacts may give rise to the spread of second-order effects, since significant variations in relative prices that translate into high rates of inflation tend to generate responses for recovery of real income by the agents, which in its turn, feeds the inflationary process. This risk tends to be greater in scenarios of overheated labor market. International experience, as well as the country's own inflationary history, recommends that the monetary authority's stance remains cautious in order to address potential secondary effects.

The strategy adopted by Copom aims at maintaining inflation, which ended 2008 close to the upper tolerance level of the target provided by the inflation targeting regime, at a level consistent with the path of inflation targets in 2009, 2010 and 2011. This strategy, which will show its results over time, takes into account the delays in the transmission mechanism and is the most adequate to deal with the uncertainty inherent in the process of formulating and implementing monetary policy.

The Committee assesses that the prospects of achieving a benign inflation scenario,in which the IPCA would progress consistently with the inflation targets, continued to consolidate. Incidentally, this progress of the prospective scenario is reflected in the inflation projections considered by the Copom and in the expectations of inflation prepared by independent analysts. The Copom believes that the loss of momentum in domestic demand led to an expansion of the idleness margin in utilization of factors, leading to reduced inflationary pressures. Furthermore, the Committee notes that the significant easing of monetary policy implemented since January, reinforced by the fiscal impulses in the same period, will have cumulative effects that will be evident in the economy after some time lag. Thus, monetary policy should be cautious in order to ensure a convergence of inflation to the target path.

The Committee believes that decisions on the development of the basic interest rate need to take into account the magnitude of the total movement from January to July, whose impacts on various economic indicators will become evident over time, in a context of gradual resumption of the utilization of production factors. The Copom also believes that a more careful approach will help to mitigate the risk of abrupt reversals of monetary policy in the future and therefore to a consistent recovery of the economy over the coming quarters. Additionaly, the Copom assesses that the preservation of benign inflation perspectives will require that the behavior of the financial system and of the economy under a new level of interest rates must be monitored carefully over time.

In light of these considerations, the Committee decided to reduce the Selic rate from 9.25% per year to 8.75% per year in the July meeting and to maintain it at this level at the September meeting. Taking into account, on one hand, the relaxing of monetary policy implemented since January and, on the other, the idleness margin of productive factors, among other factors, the Committee deems that this level of the Selic rate is consistent with a scenario of benign inflation, helping to assure the maintenance of inflation in the target path over the relevant period and thenon-inflationary recovery of economic activity.

6.3 Assumptions and inflation forecasts

According to traditionally adopted procedures, and taking into account all the available information up to the cutoff date of September 11, 2009, the baseline scenario assumes that the exchange rate remains unchanged over the forecast horizon at R$1.85/US$, and the target for the Selic rate at 8.75% per year – the level set by the September Copom meeting – against R$1.95/US$ and 9.25% considered in the *Inflation Report* of June 2009. The projection in the baseline scenario for the change, in 2009, of the set of regulated and monitored prices was reduced to 4.5%, compared to 4.8% seen in the last *Report*. This projection is based on the assumption, for all of 2009, of stable prices for gasoline; increase of 6.9% in the price of bottled gas; of 5.4% in electricity rates; and of 1.1% in for the fixed telephone rates. Regarding items for which more information is available, price changes were estimated individually, whereas for the others, the projections are based on models of endogenous determination of regulated prices, which consider seasonal components, exchange rate variations, market price inflation and inflation measured by General Price Index (IGP), among other variables. According to those models, projection of readjustments of the regulated and administrated prices, for both 2010 and for 2011, is 4.0%, compared to 4.5% in June *Report*.

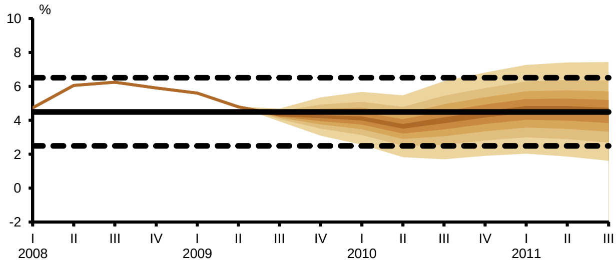
The market scenario, in turn, is based on data from the expectations survey conducted by Gerin with a representative group of institutions up to the cutoff date. In this scenario, average exchange rate expectations reduced in comparison to the values reported in the December *Inflation Report*. For the last quarter of 2009, these expectations moved from R$2.00/US$ to R$1.82/US$, and for the last quarter of 2010, from R$2.09/US$ to R$1.85/US$. For the third quarter of 2011, survey expectations projected an exchange rate of R$1.88/US$. With regard to expectations about the Selic rate for the last quarter of 2009, it moved from 9.00% to 8.75% per year, and for the last quarter of 2010 from 8.98% to 9.08% per year. For the third quarter of 2011, analysts project an average Selic rate at 9.75% per year. This path of the Selic rate is consistent with a 360 days pre-DI swap spread of , with respect to the current target for the Selic rate, of 72 basis points and 82 basis points, in the last quarter of 2009 and 2010, respectively. Additionally, the market scenario assumes changes of 4.5%, 4.1% and 4.1% for the group of regulated prices in 2009, 2010 and 2011.

Regarding fiscal policy, the projections presented in this *Report* assume the accomplishment of theprimary surplus of 2.5% of GDP in 2009 and 3.3% of GDP in 2010, in both cases adjusted by the possibility that the percentages are reduced by 0.50 percentage points, due to the implementation of the Investment Pilot Project (PPI) in 2009 and 2010, and diminished by additional 0.15 percentage points in 2010, under the Growth Acceleration Program (PAC). Moreover, it's predicted that the primary surplus would return in 2011, without adjustment, to the level of 3.3% of GDP.

Based on the above assumptions and using all available information, projections were built for the IPCA accumulated over four quarters and consistent with the trajectories of interest and exchange rates paths that characterize the baseline and market scenarios.

Figure 6.3 – Forecasted IPCA-inflation with interest rate constant at 8.75% p.a. (Benchmark scenario)

Inflation fan chart



Note: accumulated inflation in 12 months (% p.a.).

The central projection associated with the baseline scenario indicates inflation of 4.2% in 2009, 0.1 percentage points higher than the amount projected in the June *Report* and below the central value of 4.5% for the target set by the National Monetary Council (CMN). As shown in Figure 6.3, according to the baseline scenario, from the third quarter of 2009 to the last quarter of 2010, the accumulated inflation in four quarters stays below the central value of 4.5% set as the inflation target for 2009, 2010 and 2011. In part this reflects the lagged effects of the idleness of production factors seen from the fourth quarter of 2008, which, although having dropped, is likely to persist for some time. On the other hand, the twelve-month accumulated inflation stays above the central target in the first two quarters of 2011 and coincides with the target in the third. Specifically, the projection for the twelve-month accumulated inflation starts from 4.3% in the third quarter of 2009 and ends this year at 4.2%; it reaches 3.6% in the second quarter of 2010, but from then it increases and closes 2010 at 4.4%; in addition, it moves to 4.6% in the first two quarters of 2011 and falls to 4.5% in the third. Note that the increase in the forecast of inflation in the second half of 2010 and first of 2011 is partly due to the fiscal impulses expected in the second half of 2009 and the first of 2010, which have contributed to accelerate the resumption of activity. On the other hand, the decrease of the projection in the third quarter of 2011 reflects the expectation that at least some of those tax incentives are removed from the second half of 2010.

Table 6.1 – IPCA-inflation with interest rate constant at 8.75% p.a. (Benchmark scenario)

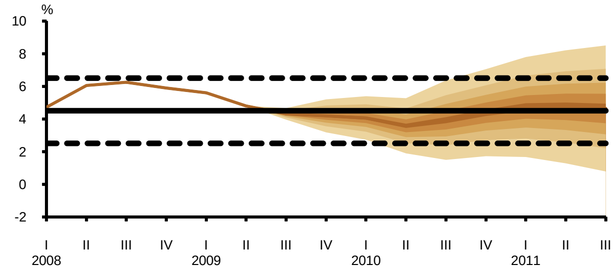
Year	Q	Probability Interval 50%	30%	10%		30%	50%	Central projection
2009	3	4.2	4.2	4.3	4.3	4.4	4.5	4.3
2009	4	3.8	4.0	4.1	4.3	4.5	4.7	4.2
2010	1	3.5	3.8	4.0	4.2	4.5	4.8	4.1
2010	2	2.9	3.2	3.5	3.8	4.1	4.4	3.6
2010	3	3.1	3.5	3.8	4.2	4.5	4.9	4.0
2010	4	3.4	3.8	4.2	4.5	4.9	5.4	4.4
2011	1	3.6	4.0	4.4	4.8	5.3	5.7	4.6
2011	2	3.5	4.0	4.4	4.8	5.3	5.8	4.6
2011	3	3.3	3.8	4.3	4.7	5.2	5.7	4.5

Note: accumulated inflation in 12 months (% p.a.).

The data in Table 6.1 indicates, for 2009, a decrease of 0.6 percentage points in the twelve-month accumulated inflation in between the actual amount, of 4.8% in the second quarter, and the projection for the end of the year, according to the baseline scenario. This movement reflects, for the inflation of market prices in the second half of 2009, lower values than those recorded in the second half of 2008, considering that the opposite occurs with regulated prices. The projection rises from the second to the fourth quarter of 2010, as well as in the first of 2011, in the latter case, positioned slightly

Figure 6.4 – Forecasted IPCA-inflation with market expected interest and exchange rates

Inflation fan chart



Note: accumulated inflation in 12 months (% p.a.).

Table 6.2 – IPCA-inflation with market expected interest and exchange rates [1]

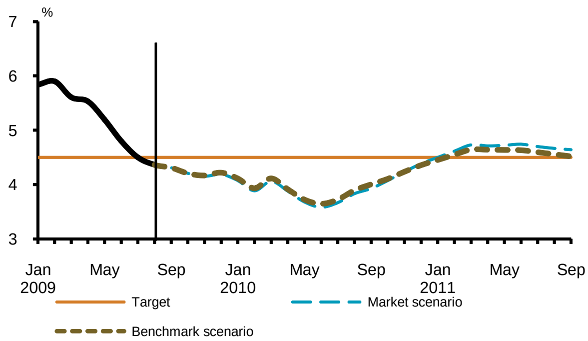
Year	Q	Probability Interval 50%	30%	10%				Central projection
2009	3	4.2	4.2	4.3	4.3	4.4	4.5	4.3
2009	4	3.8	4.0	4.1	4.3	4.4	4.6	4.2
2010	1	3.5	3.7	4.0	4.2	4.4	4.6	4.1
2010	2	2.9	3.2	3.5	3.7	4.0	4.3	3.6
2010	3	2.9	3.4	3.7	4.1	4.5	4.9	3.9
2010	4	3.3	3.8	4.2	4.6	5.0	5.5	4.4
2011	1	3.5	4.0	4.5	5.0	5.4	6.0	4.7
2011	2	3.3	3.9	4.5	5.0	5.6	6.2	4.7
2011	3	3.1	3.7	4.3	4.9	5.5	6.2	4.6

Note: accumulated inflation in 12 months (% p.a.).
1/ According to Gerin.

Table 6.3 – June 2009 *Inflation Report* forecasts

Period	Benchmark scenario	Market scenario
2009 II	4.7	4.7
2009 III	4.4	4.4
2009 IV	4.1	4.2
2010 I	4.0	4.1
2010 II	3.6	3.7
2010 III	3.6	3.8
2010 IV	3.9	4.2
2011 I	4.1	4.5
2011 II	4.0	4.4

Figure 6.5 – Forecasts and target path for twelve-month cummulative inflation



above the central target. The estimated probability of inflation exceeding the upper tolerance level of the target in 2009, according to the reference scenario, is residual.

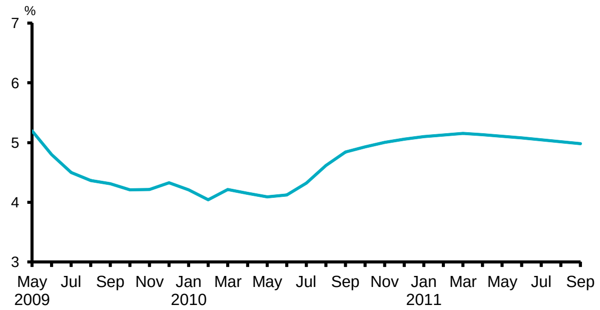
In the market scenario, the inflation projection for 2009 is 4.2%, equal to the respective baseline scenario projection and also to the projection presented in the last *Report*. As can be seen on Figure 6.4 and on Table 6.2, projections indicate continued decline in inflation accumulated in twelve months in 2009 (from 4.8% recorded in the second quarter, moving to 4.3% in third and closing the year at 4.2%), and below the central target of 4.5%. The fact that the dynamics of the projections in the market scenario approaches those obtained in the baseline scenario is a result of market analysts' expectations that both the exchange rate and the Selic rate are stable in the upcoming quarters.

Comparing the trajectories presented in this *Report* with those released in the previous *Report*, whose projections are shown on Table 6.3, in the baseline scenario, it can be seen that there was an increase of the projections from the fourth quarter of 2009. This rise is partly a result of the Selic rate reductionsince the publication of the previous *Report*, as well as of the higher than expected fiscal impulses implemented in the second quarter of this year.

Figure 6.5 shows the path of twelve-month accumulated inflation, according to the baseline and market scenarios, up to the third quarter of 2011, as well as the target trajectory. Up to August 2009, the figures are actual twelve-month inflation and, thereafter, the trajectories consider projections attached to the respective scenarios in order to construct the accumulated values. The projections witnessed a downward trend until reaching the lowest value in the second quarter (3.6% in both scenarios). From that point on they rise, so that, in the end of the relevant horizon, they virtually coincide with the target midpoint in the baseline scenario, and they remain slightly above this value in the market scenario. This slight difference between the two scenarios reflects the expectation of currency depreciation, which more than offsets the effects of increased expectations of the Selic rate on the projections.

The average forecast generated by the Vector Auto Regression models (VAR) for the twelve-month accumulated inflation is presented in Figure 6.6. Up to August 2009, the values are actual twelve-month inflation and, thereafter, they refer to the projections. There is a declining tendency of the projections for the twelve-month accumulated inflation through the third quarter of 2009. In this quarter

Figure 6.6 – Inflation forecast: VAR models

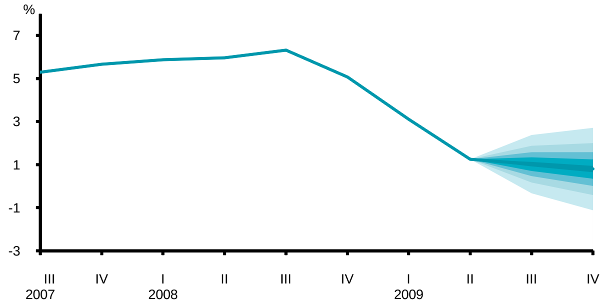


Note: accumulated inflation in 12 months (% p.a.).

Average forecast generated by the VAR models.

Figure 6.7 – GDP growth with interest rate constant at 8.75% p.a. (Benchmark scenario)

Output fan chart



the projections are close to 4.2% and they fluctuate around this level until the second quarter of 2010. From the third quarter of 2010 onwards, they become more influenced by the average inflation in recent years (mean reversion) and move toward the threshold of 5.0%.

Figure 6.7 shows the output growth fan chart built under the baseline scenario assumptions. Given that the model that generates GDP growth projections uses two variables that are not directly observable, potential output and output gap, the forecast errors associated to these projections are considerably larger than the errors related to the inflation projections. Under this scenario, the GDP growth projected for 2009 is 0.8%, the same amount projected in the June 2009 *Inflation Report*.

Three New Measures of Core Inflation

Although there is no consensus among economists about the definition of core inflation – underlying inflation – in general core inflation is defined as the indicator that measures the "true" trend of the inflation rate. In order to uncover this trend, the standard procedure is the one that seeks to exclude from the headline inflation those shocks that are considered temporary (i.e. to separate the permanent and transitory components of inflation). Behind this process lies the idea that the core would be a more appropriate indicator of the future trend of inflation than inflation itself. Thus, it would be natural to predict that the concept of core inflation, as well as their empirical counterparts, is relevant to the formulation and conduct of monetary policy. Considering this and other aspects, this box, which is largely based on da Silva Filho & Figueiredo (2009), presents three new measures of core inflation of the Broad Consumer Price Index (IPCA). Note that these measures will not necessarily replace those briefly described below and which are traditionally referred to by the Central Bank in its analysis, but could eventually join them to form a more comprehensive set of core measures.

It is widely accepted by academics and policymakers that if monetary policy reacts to temporary changes in inflation it can unnecessarily increase the volatility of both output and inflation. Moreover, given that monetary policy affects economic activity and inflation with a lag, its effectiveness is tied in part to the ability to anticipate persistent movements in inflation. Therefore, in this context, the importance of core inflation and other indicators of inflation are evident.

The literature lists several methods for calculating core inflation. However, the most common measure – which emerged in the 1970's – is the one that excludes the most volatile items (e.g., food and energy) from the headline index. Nevertheless, other methods, such as the trimmed mean, the weighted median and those that reweigh the headline components according to their volatilities are widely used.

The importance attached to core inflation varies substantially between countries. The Fed gives great emphasis to the core that excludes food and energy from the PCE (Personal Consumption Expenditures) deflator while the Bank of Canada uses core inflation (that excludes the eight most volatile components of the Consumer Price Index) as an operational guide for monetary policy. On the other hand, core inflation does not have a relevant role in the decisions of the Bank of England and the European Central Bank, an assessment that, to some degree, could also be applied to the Brazilian case. Still, since 2000 – after the implementation of the inflation targeting framework – the Central Bank of Brazil calculates and publishes three measures of core inflation, and makes reference to them in the Inflation Report and in the minutes of the meetings of the Monetary Policy Committee.[1] The first is an exclusion core that disregards administered and monitored prices as well as food prices (at home), while the other two are trimmed mean cores, with and without smoothing those prices that are subject to infrequent adjustments.

In what follows, three new core inflation measures of the IPCA are briefly described. Two arise from the exclusion of components – based on economic and statistical reasons – from the basket of goods and services that make up the IPCA. The third one reweights the IPCA components by using their relative volatilities. Regarding the two new exclusion cores, the statistical criterion aimed at excluding those items that consistently presented the greatest volatilities. In its turn, the economic criterion based itself on the reasoning that, although some regulated prices are placed among the most volatiles (e.g., vehicle fuel and household), those

1/ Two boxes on core inflation were included in the *Inflation Report*s from June and September 2000.

prices should not be excluded due to the fact that they are subjected to persistent price changes.[2]

From the above criteria, the new cores were built. The first (IPCAEX-1) excludes 10 out of the actual 52 items from of the IPCA, all belonging to the *food at home* group.[3] In that case the excluded items represented, on average, 9.6% of the total IPCA basket. The second (IPCAEX-2) excludes, in addition to the items excluded by the IPCAEX-1, those monitored prices that are placed among the most consistently volatile prices: vehicle fuel and household fuel. In this case, the exluded items accounted for an average of 15.5% of the IPCA basket, during the sample used. For comparison, the 24 excluded (or or partially excluded) items from the current core, represent approximately 44.6% of the IPCA. The third (IPCA-DP) is a double weighted core, where the original weights – based on the importance of each item in the IPCA basket – are re-weighted by their relative volatility. In such a setup, the higher the volatility of the component the lower its importance for the calculation of the core.

Figure 1 – IPCA and the new core inflation measures
Twelve-month change

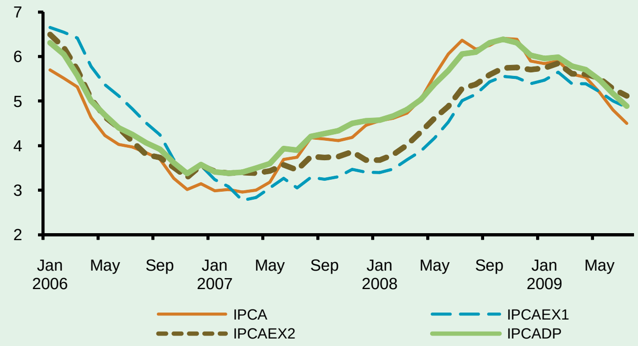


Figure 1 shows the recent behavior of inflation and the three cores described in the paragraph above.

The performance of the three new cores in the 1999–2008 period was assessed using two criteria that reflect statistical properties largely perceived as desirable: (1) absence of bias, and (2) the ability to closely follow trend inflation.

Regarding the first criteria, it is clear from Table 1 that none of the measures presented a significant bias in that period. Note that, the bias was virtually zero for the IPCAEX-1. To check the ability of each core measure to capture the headline inflation trend, the root mean squared error (RMSE) was calculated.[4] Next, each statistic was normalized by the RMSE of headline inflation itself, generating the RMSE relative to headline inflation (RRMSE). The results show that the core inflation measures capture the inflation trend better than inflation itself. Under this criterion, the IPCAEX-2 is superior to the others.

2/ In regards to this, see also Section 4 of da Silva Filho (2008).

3/ The ten items are: “tubers, roots and vegetables”, “green vegetables”, vegetables and greens, fruits, meat, fish, “sugars and sweets”, dairy products, “poultry and eggs”, and “fats and oils”.

4/ Trend inflation was proxied by a 25-period centered moving average of inflation.

Table 1 – Descriptive statistics for the new core inflation measures: 1999-2008

Core Inflation Measures	Monthly average	Standard deviation	Annual bias (p.p.)	Unbiasedness test (p-value)	RMSE#
Headline inflation	0.57	0.45	-	-	-
IPCAEX-1	0.57	0.39	-0.02	0.98	0.86*
IPCAEX-2	0.54	0.30	-0.34	0.56	0.60**
IPCADP	0.55	0.31	-0.32	0.59	0.67**

Root mean square error relative to that of headline inflation.
* and ** indicate significance at 10% and 5%, respectively, in Diebold & Mariano's test for predictive accuracy.

According to the above evidence, it can be seen that none of the three new cores dominates the rest in all analyzed criteria. On the one hand, the IPCAEX-1 has virtually no bias, while the IPCAEX-2 is the one that most closely follows trend inflation. These findings support the assessment that is important to analyze a diverse set of core measures, rather than focusing on any specific measure since, in practice, you cannot devise a core measure that is superior on all criteria. This is one of the reasons why the vast majority of countries adopting the inflation targeting framework pursues targets expressed by changes in headline inflation. At the same time core inflation measures are used among a broad range of economic indicators to support monetary policy.

References

da Silva Filho, T. N. T. (2008). "Searching for the Natural Rate of Unemployment in a Large Relative Price Shock's Economy: the Brazilian Case". Working Paper nº 163, Central Bank of Brazil, May 2008.

da Silva Filho, T. N. T. and Figueiredo, F. (2009). "Core Inflation Has Been Doing a Good Job in Brazil?". Working Paper, Central Bank of Brazil, to be published.

Leading Financial Indicators of Brazilian GDP

Financial indicators, in general, are associated with expectations regarding the occurrence of future events, as shown by Estrella and Mishkin (1997) and Stock and Watson (2001), and therefore are natural candidates for leading indicators of economic activity. This is supported by the fact that the financial indicators present some of the inherent properties of leading indicators: conformity to the business cycle, economic significance, statistical accuracy, timeliness, and little need for revisions of the series. Thus, following the development of financial indicators can be very useful for the formulation and implementation of monetary policy, given that it is essentially *forward looking*. This box aims to present evidence that some Brazilian financial indicators are relevant as leading indicators of the GDP.[1]

In order to select leading financial indicators, it is first necessary to construct the Coincident Composite Index of economic activity (ICC), as shown by Stock and Watson (1989).[2] This was built because, as the frequency of the series of GDP is quarterly, a monthly series of industrial production would not provide sufficient information on GDP, given that significant aggregate supply in modern economies focuses on services and other non industrial activities. The series that make up the ICC should therefore include, in addition to industrial production, other series that identify the state of the economy in other sectors. Table 1 shows how we selected the 133 candidate series that belong to the set of series used to build the ICC.

Table 1 – Database

Categories	Number of Series
Industrial Production and Raw Material	33
External Sector	9
Credit	7
Labor and Income	13
Financial Indicators	45
Confidence Indicators	12
Others	14
Total	133

1/ For leading indicators of economic activity in Brazil, with specific focus on financial time series, see Duarte, Issler and SPACOV (2004), SPACOV (2001) and Hollauer and Issler (2006).

2/ For a survey of the literature, see Marcellino (2005).

From the correlation analysis and tests of causality between the series,[3] the following were selected as candidates: poultry processing, fertilizer production, shipment of corrugated paper, plastic containers, packaging paper, actual sales, employed individuals in the industry, capacity utilization in São Paulo industry, industrial production, exports, imports, imports of intermediate goods, total production of auto vehicles, energy charge and flow of heavy vehicles.

Following Stock and Watson (1989) and with the aid of a Kalman filter, the quarterly ICC based on a subset of the series above was built. It contains: industrial production, packaging paper, plastic containers, corrugated cardboard shipping and actual industrial sales. Figure 1 shows the quarterly ICC obtained from the monthly series transformed and seasonally adjusted as well as the GDP seasonally adjusted. The seasonally adjusted quarterly correlation between the ICC and the GDP is 0.41 in a quarter and 0.80 in 6 months.

Once the ICC is constructed, we choose the leading financial indicators of this index. Table 2 shows the financial time series considered.[4] A pre-selection of the above series, based on contemporaneous and lagged correlations of those with ICC,[5] indicated which would be selected as good candidates for the leading indicator of the ICC. Then, these series were subjected to the same analysis when selecting coincident series of the ICC – correlation and causality tests. We finally arrive at four series candidates for the leading: IBRX-100 (4th lag), spread of debentures(10th lag), real return on equities of the vehicle sector (3rd lag) and the term structure of interest rates (2nd lag).[6]

Figure 1 – Coincident index of GDP with seasonal adjustment

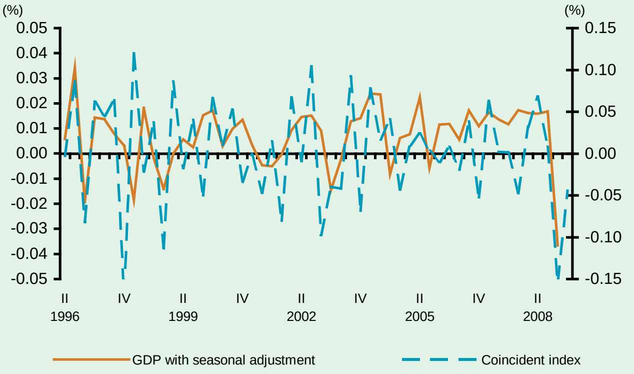


Table 2 – Financail indicators

Denomination of variable and source
Bovespa index
Índice IBRX –100
Debentures – average spread over interest rates public
Means of payment – M1
Means of payment – M2
Means of payment – M3
Means of payment – M4
Selic 1/
Average spread of nonearmarked operations
Spread of fixed rates long and short term public bonds
DI fixed interest rate 2/
Term structure of interest rates 3/
Term structure of real interest rates 4/
Sectorial returns (real and nominal) of stocks 5/

Sources: Andima, Central Bank of Brazil, BM&F and Bovespa
1/ Monthly accumulated rate and annualized accumulated rate.
2/ Maturities of 30, 60, 90, 120, 180 e 360 days – average and end of period.
3/ Diference between 180 days swap rate (average of period) and interest rates Selic monthly accumulated and then annualized.
4/Term Structure of Interest Rates deflated by monthly IPCA accumulated in 12 months.
5/ Sectors: Food and Beverage, Construction, Energy, Finance, Mining, Oil and Gas, Chemistry, Telecomunications and Vehicles.

3/ The previous selection of variables was based on contemporaneous correlations between leads and lags between each series and the series of industrial production. A series was selected if its correlation with current industrial production is positive and high, while the correlations of lags and leads are close to zero. Then, we do with this series several other tests in the time domain and frequency. In the time domain, the following tests were performed: Granger-causality with industrial production in two and multidimensional models; we analyzed the co-integration of the series level with industrial production in two-dimensional models; we observed, in a simple regression where the dependent variable is industrial production and the regressor is the candidate series composing the coincident index, the sign, significance and stability of the estimated coefficient over time. In the frequency domain, we looked at the spectral correlation between the series.

4/ The sample period begins in January 1991 for a large part of the series. The exceptions are: the Swap DI-Pre series and the series constructed from this series are available from September 1999. Sector returns are available from January 2001. The series of bond spreads began in July 2005.

5/ We consider the return series level and the index series in first differences.

6/ The term structure is defined as the difference between the swap rate pre-DI (BMF) of 180 days and the Selic interest rate, accumulated in the month and annualized. The debentures are of publicly traded companies with credit rating A, AA or AAA and with a duration of approximately one year.

Figure 2 – Financial indicators and GDP with seasonal adjustment

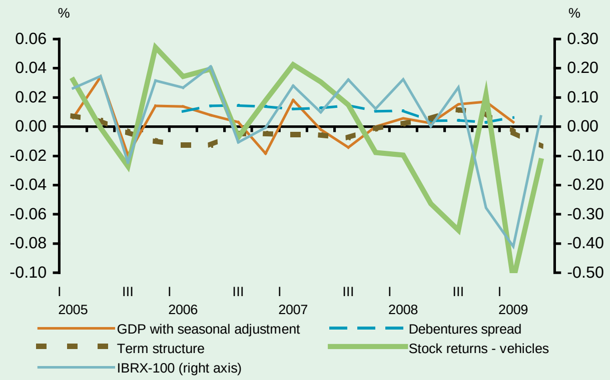


Figure 2 shows the quarterly financial series chosen as candidates (obtained from the transformed monthly series) as well as the seasonally adjusted quarterly GDP. The correlations of the quarterly financial series with quarterly GDP reached, respectively, 0.75, 0.58, -0.18 and -0.21. However, because our interest is restricted to the choice of the series that show positive correlation, we selected IBRX-100 and the spread of debentures as our candidates.

Finally, this box presents evidence that some financial indicators are relevant as leading indicators of the Brazilian GDP. From a total of 45 financial indicators initially evaluated – with monthly availability – two showed a good record of anticipating economic activity: the IBRX-100 is a good predictor of the state of the economy a quarter ahead, and the spread of debentures is good for three quarters ahead. Moreover, this box shows that the monthly series of general physical production, packaging paper, plastic containers, corrugated cardboard shipping and actual sales industry can be combined to get a good coincident indicator of quarterly GDP.

References

Duarte, A., Issler, J. and SPACOV, A. (2004). “Coincident Indicators of Economic Activity and a Chronology of Recessions in Brazil.” EPGE-FGV, *Economic Essays* nº 527.

Estrela, A. and Mishkin, F. (1997). “The Predictive Power of the Term Structure of Interest Rates in Europe and the United States: Implications for the European Central Bank.” *European Economic Review*, *41*, 1375-1401.

Hollauer, G. and Issler, J. (2006). “Building Background Indicators for the Brazilian Industrial Activity and Comparison of Methods.” *IPEA Working Paper* nº *1191*.

Marcellino, M. (2005). “Leading Indicators: What Have We Learned?” *IGIER – Università Bocconi, Working Paper* nº *286*.

Spacov, A. (2001). "Background and Coincident Indexes of Economic Activity in Brazil: An Application of Canonical Correlation Analysis." *EPGE-FGV, Master's Thesis*.

Stock, J. and Watson, M. (2001). "Forecasting Output and Inflation: the Role of Asset Prices." *Working Paper, NBER nº 8180*.

Stock, J. and Watson, M. (1989). "New Indices of Coincident and Leading Indicators." In *NBER Macroeconomic Annual 4, eds. O. Blanchard and S. Fischer, Cambridge, MA: The MIT Press*, 351-394.