IPCA, IPC-Fipe and IPC-Br: Methodological and Empirical Differences

Differences in the recent performances of various consumer price indices have resulted in difficulties in attempts to fathom the behavior of inflation. For instance, while the IPCA expanded by 5.15% in 12 months, covering the period from June 2003 to May 2004, the Consumer Price Index – Institute of Economic Research Foundation (IPC-Fipe) increased by 4.45% and the IPC-Br by 5% in the same period. The differences among these rates result from a series of factors of a methodological nature. The most important are as follows:

i.   The IPCA calculates the change in the prices of goods consumed by families with median income levels ranging from 1 to 40 times the minimum monthly wage, in 9 metropolitan regions (Belém, Belo Horizonte, Curitiba, Fortaleza, Porto Alegre, Recife, Rio de Janeiro, Salvador and São Paulo), in the Federal District and in the municipality of Goiânia. The IPC-Fipe is a consumer price index that covers only the municipality of São Paulo and income levels ranging from 1 to 20 times the minimum monthly wage. The IPC-Br covers the same area as the IPCA, plus Florianópolis, and is based on income levels from 1 to 33 times the minimum monthly wage. One important difference between the IPCA and the IPC-Br is the variable of regional aggregation. While the IPCA uses the total urban income of each region as its weighting factor, the IPC-Br weights its figures according to the resident population.

ii. With regard to what is known as the consumption basket, the IPCA uses the Household Budget Survey (POF), which was carried out by IBGE in 1995 and 1996 and incorporated into the index as of August 1999, as its basis of calculation. More

recently, IBGE released the results of a new POF, carried out between June 2002 and July 2003, but has not yet incorporated it into the weighting structure of its prices indices. The IPC-Fipe and the IPC-Br are based on the POF elaborated between 1998 and 1999 and adopted in January 2000.

iii. The calculation methodologies used by the different indices vary. The IPCA is a Laspeyres index that uses a formula given by: $L_t = \dfrac{\sum_i p_{i,t} q_{i,0}}{\sum_i p_{i,0} q_{i,0}}$,

in which $p_{i,t}$ is the price of good i in period t, and $q_{i,0}$ is the quantity consumed. This formula can be developed in order to make the effect of the weighting of the quantity consumed clear: $L_t = \sum_i w_{i,0} \dfrac{p_{i,t}}{p_{i,o}}$, in which $w_{i,0} = \dfrac{p_{i,0} q_{i,0}}{\sum p_{i,o} q_{i,0}}$, or , $w_{i,0}$

is the participation of outlays on good i in the initial period in the total spending of the consumer. Thus, the IPCA calculates the change in the prices of goods and services between two periods, weighted by the participation of outlays on each good in total consumption. Note that the index calculates the outlay with the same consumption in two different periods, thus avoiding substitution in consumption. On the other hand, the IPC-Fipe calculates the geometric median of the price relatives between two periods, weighted by the participation of the outlay on each good in total consumption. This index is given by: $IG_t = \prod_i (\dfrac{p_{i,t}}{p_{i,0}})^{w_{i,0}}$, in which $\prod$ is the product of the

price relatives $\dfrac{p_{i,t}}{p_{i,0}}$, weighted by the participation

of each good in total outlays ($w_{i,0}$). Note that the rise in the price of a good generates two effects for the consumer: on the one hand, the consumer loses buying power in terms of the good that had its price increased, reducing consumption of that good (income-effect); on the other, since there is an alteration in relative prices, the consumer reallocates his/her consumer spending in such a way as to substitute the products that became relatively more expensive for others that are relatively cheaper (substitution-effect). In the Laspeyres indices, such as the IPCA, price

elasticity is zero (Leontief utility function). The substitution-effect is not perceived in consumption, thus generating an overestimated rate of inflation. In the case of the IPC-Fipe, the utility function is of the Cobb-Douglas type with price elasticity equal to one. This methodology makes it possible to substitute the consumption of goods and services that underwent increases in relative prices for those that became relatively cheaper and is therefore capable of perceiving the already cited substitution-effect.

iv. Finally, the IPCA, IPC-Br and IPC-Fipe deal differently with some of the increases in government managed contractual and monitored prices, such as increases in electricity and telephone rates. While the IPCA and IPC-Br are immediately affected when there is an increase, the IPC-Fipe is calculated on the basis of the cash concept or, in other words, the increase is included in accounting only when household spending is impacted. This treatment causes differences in the rates of monthly inflation that tend to disappear in the accumulated bimonthly figures.

Viewed over a long-term horizon, there is a tendency toward lower inflation under the IPC-Fipe compared to the IPCA, while there is greater proximity between the IPC-Br and the IPCA. The chart compares accumulated growth in the period under the IPCA and IPC-Fipe from 1980 to 2003 and for the subperiods of 1980/94 and 1995/03. The IPC-Br only appears as of 2001, the year in which it was transformed into a national index. Prior to 2001, it covered only Rio de Janeiro and São Paulo. It should be noted that, in the last 24 months, the rate of inflation measured by the IPCA accumulated a difference of more than 100% compared to the IPC-Fipe.

In summary, the fact that price indices based on differentiated methodologies register distinct performances over time is not atypical. The specificities of the IPCA, IPC-Br and the IPC-Fipe suggest that the indices do not necessarily converge, though the IPCA and IPC-Br come quite close over the short-term. Aside from this, the IPC-Fipe tends to register price change that are lower than those perceived by the IPCA over the long-term.

Consumer Price Index
Long-term comparison

Period	Median annual growth (%)			Median annual difference (%)	Difference accumulated in the period[1] (%)
	IPCA	IPC-Fipe	IPC-Br		
1980-1994	451.67	429.54	...	4.18	84.84
1995-2003	9.12	8.10	...	0.95	8.84
2001-2003	9.82	...	9.67	0.13	0.40
1980-2003	200.44	191.82	...	2.96[2]	101.18[2]

1/ The first two periods refer to the difference between IPCA and IPC-Fipe and the third period refers to th difference between IPCA and IPC-Br.
2/ Refers to the ratio between IPCA and IPC-Fipe.