

The consumer prices indices accelerated in the quarter ended February 2011, compared with that ended November of the previous year. This movement was affected by seasonal pressures of perishable foodstuffs and tariff readjustments, especially public transportation, and the rise in education costs, among other factors.

It is important to emphasize that the recent price evolution, still expressed by the high level of the inflation cores in all the criteria used, mostly reflected the rise in service prices, which showed higher inflationary persistence. In this environment, in the following months, the inflation trajectory will be conditioned, among other factors, by the exhaustion of the mentioned seasonal pressures and by the rise of basic interest rates and macroprudential measures, in sharp contrast to the effects of high commodity price levels.

2.1 General indices

Table 2.1 – General price indices

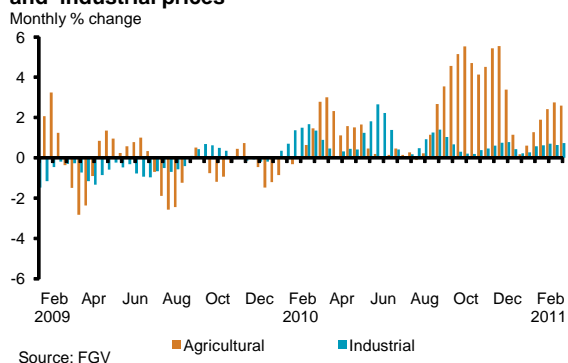
	% monthly change				
	2010			2011	
	Oct	Nov	Dec	Jan	Feb
IGP-DI	1.03	1.58	0.38	0.98	0.96
IPA	1.32	1.98	0.21	0.96	1.23
IPC-Br	0.59	1.00	0.72	1.27	0.49
INCC	0.20	0.37	0.67	0.41	0.28

Source: FGV

The General Price Index – Internal Supply (IGP-DI) variation, calculated by the FGV, reached 2.33% in the quarter ended February, against 3.75% in that ended November. This reduction, within scenario of consumer and civil construction prices rises, evinced the deceleration of the prices to the manufacturer, favored by agricultural prices moderation.

The Broad Producer Price Index (PPI), which weighs 60% in the composition of the IGP-DI, went up 2.42% in the quarter ended February, against 4.85% in the September – November 2010 period. The lesser rise was mainly related to the deceleration, from 15.58% to 4.74%, registered in the price variation of agricultural products, a movement consistent with the falloffs registered in the prices of beans, rice, potatoes, cattle, pork and soybeans. On the other hand, the prices of permanent crops posted an increase in the quarter, influenced by the rises in the items cocoa beans, banana, orange and coffee beans.

Figure 2.1 – IPA-10, IPA-M and IPA-DI – Agricultural and industrial prices



Prices of industrial products rose 1.58% in the quarter ended February, against 1.45% in that ended November. This acceleration reflected the pressures exerted by the prices of the items metallic minerals, tobacco, textiles, clothing articles and petroleum derivatives. Agricultural prices registered twelve-month cumulative variation of 29.84% in February, against 23.86% in November, while the industrial prices increased, respectively, 8.65% and 9.90% in the same comparison bases.

Variations in the Consumer Prices Index (IPC) and in the National Cost of Construction Index (INCC), with respective weights of 30% and 10% in the composition of the IGP-DI, were 2.51% and 1.37%, respectively, in the quarter ended February, against 2.07% and 0.78% in that ended November 2010. The acceleration registered in the IPC derived from pressures from education and transportation, while that related to INCC evinced the rises of the items labor and goods and services.

The IGP-DI expanded 11.30% in 2010, the largest variation since 2004, against -1.43% in the previous year, registering acceleration in the annual variation of its three components. The IPA varied 13.85%, against -4.08% in 2009, while IPC and INCC increased 6.24% and 7.77%, respectively, against 3.95% and 3.25% in the previous year. The IPA variation in 2010 reflected rises of 25.61% in the prices of agricultural products and 10.13% in industrial prices.

2.2 Consumer price indices

Extended National Consumer Price Index

The Extended National Consumer Price Index (IPCA), published by IBGE, increased 5.91% in 2010, against 4.31% in the previous year, registering rises of 3.13% in regulated prices of goods and services and 7.09% in non regulated prices, against 4.74% and 4.13% in 2009, respectively.

IPCA's variation amounted to 2.28% in the quarter ended February 2011, against 2.04% in that ended November 2010, pointing out that, excluding food and beverage's group, the indicator registered respective rises of 2.14% and 1.10% in the mentioned quarters.

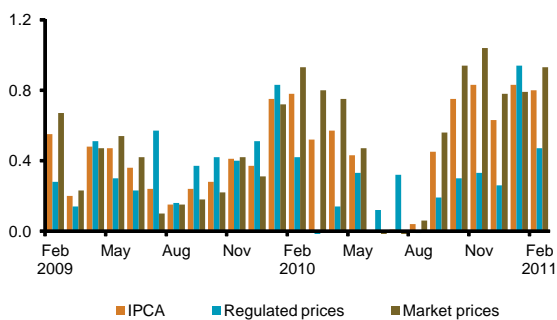
The general indicator's behavior in the quarter derived from the acceleration, from 0.82% to 1.68%, in regulated prices, and from the downturn, from 2.56% to 2.52%, in non-regulated prices. In this segment, there were respective

Table 2.2 – Consumer prices

	% monthly change				
	2010			2011	
	Oct	Nov	Dec	Jan	Feb
IPCA	0.75	0.83	0.63	0.83	0.80
Non regulated prices	0.94	1.04	0.78	0.79	0.93
Tradables	1.00	1.53	0.95	0.43	-0.02
Nontradables	0.88	0.60	0.63	1.10	1.78
Services	0.49	0.46	0.58	0.87	2.28
Regulated prices	0.30	0.33	0.26	0.94	0.47

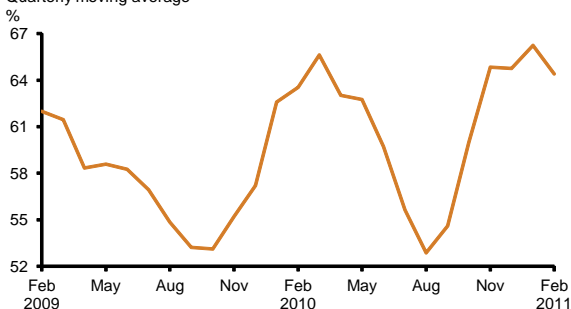
Sources: IBGE, Banco Central and FGV

Figure 2.2 – IPCA
% monthly change



Source: IBGE

Figure 2.3 – IPCA
% of items with increase
Quarterly moving average



Source: IBGE

variations of 1.36% and 3.55% in the marketable and non-marketable prices, against 3.45% and 1.77% in the quarter ended November. It should be mentioned, in the non-marketable segment, increases of 10.54% in the prices of perishable foodstuffs and of 6.61% in the item courses. The deceleration observed in the scope of marketable goods was especially related to the lesser rises of apparel group prices and of items furniture and utensils, cattle, bakery goods, and sugars and sugar products.

Considering twelve-month periods, the IPCA accumulated a 6.01% variation on February, against 5.63% in November and, not including food, 4.96% against 4.59% in the same comparison bases. The seasonal pressure observed in the segments courses, public transportation and perishable foodstuffs tends to exhaust in the coming months, which may contribute to the IPCA deceleration.

The service prices, boosted by the rise of education prices, went up 3.77% in the quarter ended February, against 1.37% in that ended November 2010, while, considering twelve-month periods, respective variations of 8.39% and 7.36% were registered in the final months of the periods mentioned.

The diffusion index – indicator of the proportion of the items that indicated a positive IPCA variation, evincing spreading prices rises, registered an average of 64.41% in the quarter ended February, against 64.84% in that ended November, and 63.54% in the same period in 2010. In 2010, the index average reached 61.18%, against 57.53% in the previous year.

2.3 Regulated prices

The regulated prices increased 3.13% in 2010 and account for 0.92 point of IPCA's total variation in the year. The highest upward pressures derived from the items public transportation, 7.53%; notary, 5.19%; health insurance, 6.87%; and mail service, 6.35%; while, in the opposite way, registration and licensing services, vehicle gas and toll prices dropped 9.53%, 1.13% and 5.82%, respectively, in the year.

IPCA's group of free and regulated prices presented variations of 2.52% and 1.68%, respectively, in the quarter ended February, against 2.56% and 0.82% in that ended November. The regulated price' variation represented 0.49 point of IPCA's inflation of 2.28%, within this period.

Table 2.3 – IPCA

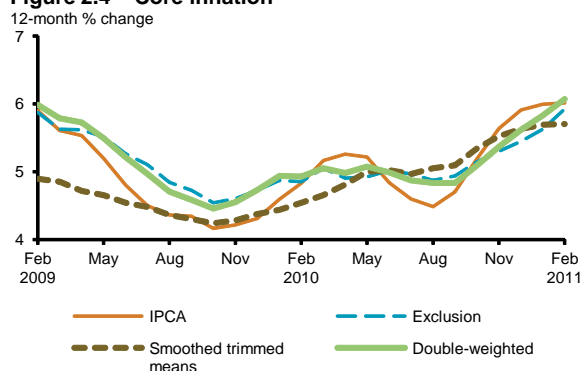
	Weights	% monthly change					
		2010			2011		
		Nov	Dec	Year	Jan	Feb	Year
IPCA	100.00	0.83	0.63	5.91	0.83	0.80	1.64
Market prices	71.10	1.04	0.78	7.09	0.78	0.93	1.73
Regulated prices	28.90	0.33	0.26	3.13	0.94	0.47	1.42
Main items							
Electricity	3.19	0.48	0.02	3.05	-0.38	0.09	-0.29
Natural gas vehicle	0.10	0.05	-1.60	-1.13	-1.95	-0.36	-2.30
Pipeline gas	0.10	-0.34	-0.03	1.48	6.21	1.13	7.41
Diesel fuel	0.08	-0.21	0.09	-0.11	0.71	0.65	1.36
Electricity	0.12	0.09	0.30	-5.82	0.15	0.02	0.17
Tolls	1.28	0.63	0.17	1.91	0.00	1.69	1.69
Water and sewage	1.60	0.00	0.03	3.38	0.07	0.42	0.49
Urban bus	3.77	0.30	0.07	7.53	4.13	1.30	5.48
Air ticket	0.36	-1.26	7.61	3.15	6.21	-11.43	-5.93
Gasoline	3.94	0.81	0.25	1.67	0.62	0.50	1.12
Bottled cooking gas	1.17	0.10	0.25	2.10	0.12	0.03	0.15
Medicine	2.80	0.09	0.11	3.36	-0.06	-0.22	-0.28
Health plans	3.48	0.58	0.58	6.87	0.59	0.59	1.18

Source: IBGE

Table 2.4 – Consumer prices and core inflation

	% monthly change					
	2010			2011		
	Oct	Nov	Dec	Jan	Feb	
IPCA	0.75	0.83	0.63	0.83	0.80	
Exclusion	0.44	0.52	0.60	0.76	0.96	
Smoothed trimmed means	0.55	0.56	0.52	0.54	0.40	
Double-weighted	0.58	0.66	0.71	0.80	0.70	
IPC-Br	0.59	1.00	0.72	1.27	0.49	
Core IPC-Br	0.41	0.43	0.55	0.41	0.32	

Sources: IBGE, Banco Central and FGV

Figure 2.4 – Core inflation

Sources: IBGE and Banco Central

Notary tariffs went up 5.35% in the quarter, following the expansions related to interstate bus, 4.14%; inter-municipal bus, 3.57%; and subway, 3.00%. In addition, public bus tariffs, evincing the rises registered in São Paulo, 11.11%; Recife, 8.13%; Salvador, 8.70%; Porto Alegre, 10.20%; and Belo Horizonte, 6.52%, increased 5.56% in the quarter ended February.

2.4 Inflation core

The 12-month variation of IPCA's inflation cores, considering the three measures calculated by the Central Bank, increased in the quarter ended February. The IPCA's core, by exclusion, increased 2.34% against 1.34% in the quarter ended November. In twelve months, the indicator growth amounted to 5.92% in February, against 5.30% in November.

The core calculated by smoothed trimmed means⁵ increased 1.47%, against 1.55% in the quarter ended November. The indicator's twelve-month cumulative variation closed at 5.70% on February, against 5.52% in November.

The double-weighting⁶ core registered growth of 2.23% in the quarter ended February, against 1.64% in that ended November. The twelve-month analysis reveals that the indicator variation moved from 5.37%, in November, to 6.07% in February.

The IPC inflation core, released by the FGV, calculated through the method of smoothed trimmed means, went up 1.29% against 1.37% in the quarter ended November. Considering twelve-month periods, the indicator registered rises of 5.02% on February and of 4.95% in November.

2.5 Market expectations

According to Focus Research – Market Readout of March 18, the medians of the forecasts related to the annual IPCA variations for 2011 and 2012 reached 5.88% and 4.8%, respectively, against 5.3% and 4.5%, at the end of 2010.

5/ The criterion used to calculate this indicator excludes the items whose monthly variation stays, in the distribution, above the percentile 80 or below the percentile 20, besides smoothing, throughout twelve months, the fluctuation of items whose variations are concentrated in few periods of the year.

6/ The criterion used to calculate this indicator consists in the re-weighting of the original weights – based on the importance of each item for the IPCA basket – by the respective degrees of relative volatility, a proceeding that reduces the importance of the more volatile components.

Figure 2.5 – IPCA

Medians

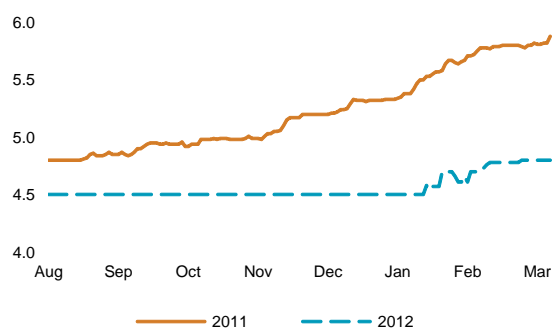


Figure 2.6 – IGP-M and IPA-DI

Medians 2011

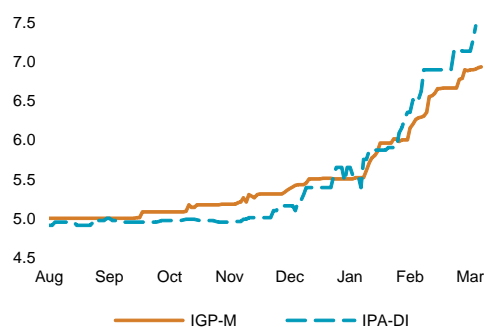


Figure 2.7 – Exchange rate

Medians 2011

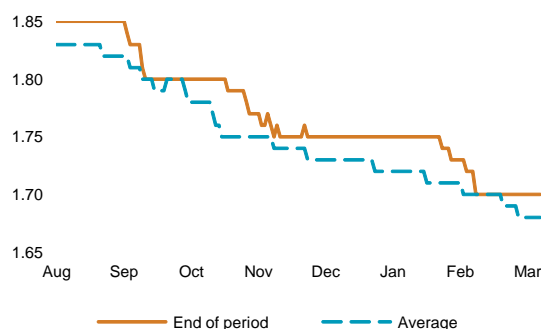


Table 2.5 – Summary of market expectations

	9.30.2010		12.31.2010		3.18.2011	
	2011	2012	2011	2012	2011	2012
IPCA	5.0	4.5	5.3	4.5	5.9	4.8
IGP-M	5.1	4.5	5.5	4.5	7.0	4.9
IPA-DI	5.0	4.5	5.4	4.5	7.5	4.7
Regulated Prices	4.7	4.5	4.5	4.5	4.5	4.5
Selic (end-of-period)	11.8	10.5	12.3	10.8	12.5	11.3
Selic (average)	11.5	10.9	12.1	11.3	12.2	11.9
Exchange rate (end-of-period)	1.8	1.9	1.8	1.8	1.7	1.8
Exchange rate (average)	1.8	1.9	1.7	1.8	1.7	1.7
GDP growth	4.5	4.5	4.5	4.5	4.0	4.4

The expectations median for the inflations twelve months ahead – mitigated – corresponded to 5.36%, smoothed above the level observed at the end of December.

The median regarding the General Price Index – Market (IGP-M) variation for 2011 increased from 5.5%, at the end of December, to 6.97% on March 18th, while that related to the Producer Price Index – Internal Supply (IPA-DI) moved from 5.4% to 7.45%. In the same period, the median referring to 2012 for the IGP-M increased from 4.5% to 4.89%, while for the IPA-DI, it moved from 4.5% to 4.72%.

The median of expectations regarding the 2011 and 2012 evolution of the government-set prices or prices regulated through contracts came to 4.5% on March 18, same level observed at the end of December.

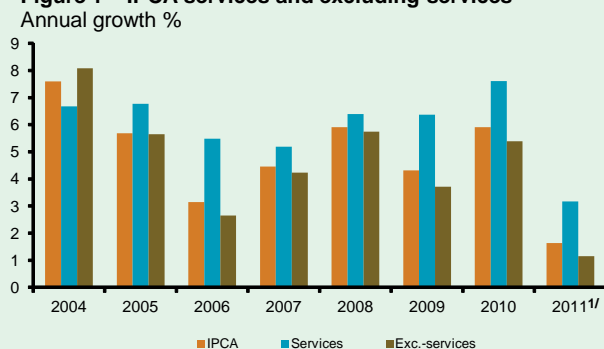
The median of the exchange rate forecasted by the market for the end of 2011 was adjusted, from R\$1.75/US\$ to R\$1.70/US\$, between the end of December and March 18, while the forecast for the end of 2012 was reviewed from R\$1.80/US\$ to R\$1.75/US\$. The forecasts median for the average exchange rate related to 2011 dropped from R\$1.72/US\$, on December 31, to R\$1.68/US\$, on March 18th, while the median for 2012 decreased from R\$1.79/US\$ to R\$1.74/US\$, between both dates.

2.6 Conclusion

The consumer inflation rates in the beginning of 2011 reflected the impact of seasonal factors, as the rise of perishable foodstuff prices, of readjustments in public transportation tariffs and in education costs, and the mismatches between aggregate supply and demand, indicated, especially, in the service prices evolution. The inflation trajectory in the following months may reflect the impacts of the more restrictive stance adopted in the conduction of the monetary policy, macroprudential measures and depletion of seasonal factors. However, uncertainties originated from the external scenario, especially the evolution of commodity prices, still persisted.

Service Prices Dynamics: an analysis of the current experience

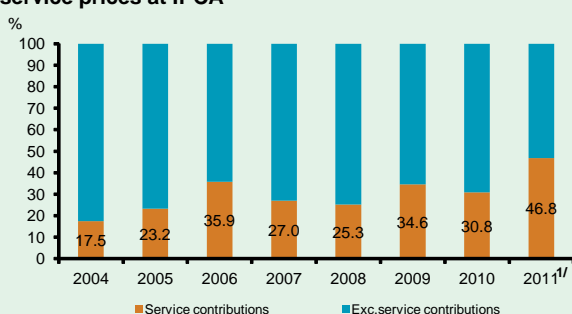
Figure 1 – IPCA services and excluding-services



Services prices have been registering variations higher than those of the National Wide Consumer Price Index (IPCA) in the last years, in all the metropolitan regions researched, causing changes in the relative prices between the contents of the consumption basket. This box explores the services prices dynamics in national and regional scope, emphasizing the behavior of relative prices and the main contents of this segment.

The services inflation¹ overcame IPCA's variation in the last six years, according to Figure 1. From March 2004 to February 2011, the services prices mean annual variation reached 6.45% while the ones related to IPCA and to "IPCA excluding services" were 5.32% and 5.0%, respectively. Within the period considered, the services relative prices² increased 9.63% in relation to other IPCA segments.

Figure 2 – Relative contributions (estimates) of service prices at IPCA



The service prices contributions for the aggregate index variation significantly overcame the weight³ of the group in the IPCA basket, according to Figure 2, pointing out the results of 2006, 2009 and 2010, when services were responsible for, in this order, 35.9%, 34.6% and 30.8% of the annual IPCA variation. The retreat in 2010 is partly explained by the sharp rise of food prices, since the services inflation rose comparatively to the one registered in 2009. In the first two months of 2011, the services contribution reached 46.8%, mostly due to the

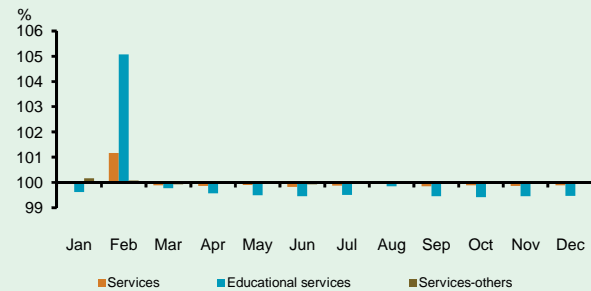
1/ For this work's objectives, until June 2006, 58 subitems were considered in the services prices composition, with approximate weight of 20%; since July 2006, when it was initiated the IPCA series with the current methodology, referenced in the Family Budget Research (POF) 2002-2003, 64 subitems were considered in the composition of services prices group, corresponding to around 24% in the general index weighing for Brazil.

2/ It was considered the ratio between the geometric factor corresponding to the variation of services prices group and the one corresponding to the variation of other prices group, components of IPCA, for the period between March 2004 and February 2011.

3/ The seasonal factor average was calculated as, where the percentage variation in the "t" month of year "a"; and it is the percentage variation accumulated of year "a". Results lower than 100 represent negative seasonality and results higher than 100 represent positive seasonality for the month.

period's seasonality, which reflects the readjustments with respect to education.

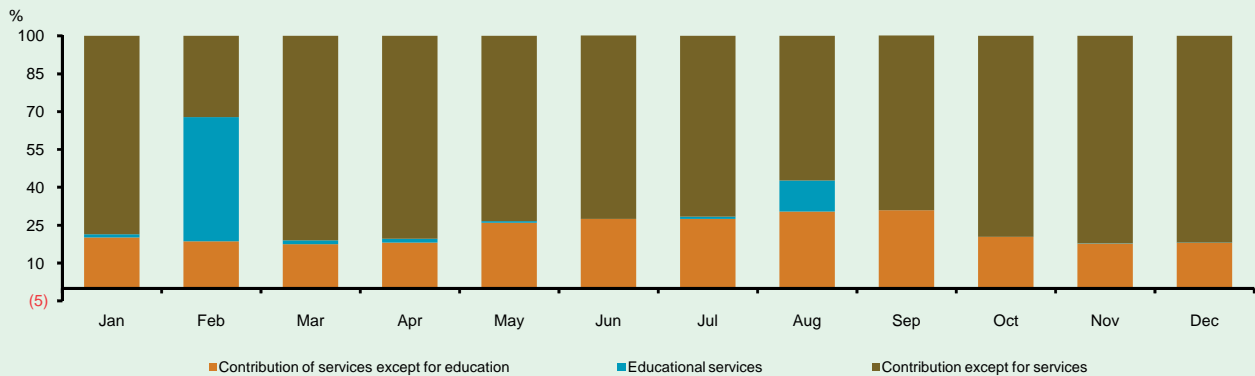
Figure 3 – IPCA Services and componentes – Seasonal^{1/}



Source: IBGE, made by Central Bank.
 1/ Data lower than 100 mean a negative seasonality and data above 100 mean a positive seasonality in the month.

Given the generic nature of the services, it is appropriate to divide⁴ it into subgroups according to the type of service to which they refer and, particularly, to isolate the services related to education. A preliminary analysis suggests that education follows seasonal pattern different from the other series, according to Figure 3. For the service prices group, the seasonal factor⁵ regarding February represented, in average, 101.2% of each year's monthly mean variation. It showed to be more significant for educational services, to which it represented, in average, 105.1% of each year's monthly mean variation. Still regarding educational services, the seasonal factors related to August and March, despite lower than 100% in the period average, overcame this level in three and in two of the seven years analyzed, respectively. For services prices not related to education, the seasonal pattern seems less defined, with January and February being the months most distant from each year's mean variation.

Figure 4 – Monthly average of relative contributions (estimated) of service prices, except for education and education-services for the IPCA^{1/}



Source: IBGE, made by Central Bank.
 1/ With the aim to avoid that outliers biased the averages, they have been estimated excluding those months in which the sum of payment contributions were within -0,1 and 0,1 (Jun/2005; Aug/2006; Jun/2010; Jul/2010; Aug/2010).

4/ Similar proceeding was carried out in the study "The evolution of goods and services prices in economic crises", presented in the Inflation Report published on June 2009.

5/ The seasonal factor average was calculated as, $\left\{ \sum_{a=2004}^{2010} \left[\left(\frac{\pi_{t,a}}{100} + 1 \right) / \left(\frac{\pi_a}{100} + 1 \right)^{1/12} \right] \right\} \frac{100}{7}$ where $\pi_{t,a}$ the percentage variation in

the "t" month of year "a"; and π_a it is the percentage variation accumulated of year "a". Results lower than 100 represent negative seasonality and results higher than 100 represent positive seasonality for the month.

The services contribution for the IPCA present themselves relatively higher in February and August, due to readjustments related to education, according to Figure 4, while the highest contributions related to the other services are used to fall upon May to September.

Table 1 presents the services prices annual mean variations per subgroup, for each one of the metropolitan regions considered in IPCA's building. In Brazil, the expenses with education services and with the other services registered annual mean rises of 6.65% and 6.41%, respectively, from March 2004 to February 2011, while the annual mean variation of "IPCA exclusive services" reached 5.06%. The expenses with domestic servant registered the highest annual mean growth, 10%, exerting, in average, contribution of 21% to the services prices variation. In addition, important average rises occurred in the items vehicles maintenance, 6.89%; personal care, 6.88%; condominium, 6.27%; and health, 6.08%.

Table 1 – Subgroups of IPCA services by region

Region ^{1/}	Annual average change – Mar/2004 to Feb/2011 (% a.y.)											
	Brasil	BRA	GOI	RMB	RMBH	RMC	RMF	RMPA	RMR	RMRJ	RMS	RMSP
IPCA – Services	6.45	7.10	6.85	6.69	7.71	7.28	6.92	6.59	6.71	5.94	7.04	5.80
Subgroup referring to education	6.65	7.04	6.43	6.43	6.41	6.97	7.77	6.66	7.90	6.79	7.27	6.26
Formal education	6.57	6.64	6.06	6.33	6.46	6.99	8.04	6.55	8.01	6.68	7.23	6.14
Education others	6.93	8.86	9.25	6.33	6.21	6.88	4.78	7.17	7.20	6.37	7.25	6.78
Subgroup services-others	6.41	7.14	7.02	6.77	8.09	7.39	6.62	6.57	6.31	5.76	6.94	5.72
Rent	5.03	6.71	4.51	5.57	7.34	6.64	6.06	3.73	4.22	3.62	4.65	5.03
Condominium fee	6.27	8.38	6.91	7.09	7.77	7.34	5.41	7.15	8.20	8.41	8.13	3.67
House construction and maintenance	3.22	3.31	4.11	4.98	3.35	3.77	2.48	3.06	4.02	2.81	1.10	3.36
Personal care	6.88	8.17	8.62	8.59	8.33	7.09	7.40	6.81	7.11	5.64	8.26	5.88
Domestic help	10.00	9.88	9.88	9.88	11.37	9.88	9.89	9.86	9.75	9.02	10.99	9.96
Leisure	6.22	5.70	5.63	4.59	9.00	7.14	4.57	6.32	8.00	4.50	5.35	5.73
Auto service	6.89	5.48	7.76	2.23	6.88	8.64	6.87	8.04	2.52	6.50	5.75	7.47
Labor ^{2/}	7.87	7.56	7.56	7.56	10.89	7.56	7.56	7.46	5.07	6.57	8.33	7.86
Health	6.08	6.72	7.19	6.42	6.37	6.36	6.00	5.20	4.88	6.34	6.48	6.03
Banking services	2.06	1.42	1.06	0.82	2.08	1.17	1.43	1.48	2.06	2.41	2.17	1.14
Transportation	5.05	4.20	7.32	10.63	7.34	7.44	0.54	6.93	4.77	2.29	10.59	4.09
Others	3.63	4.76	5.72	4.60	2.42	5.46	3.26	3.90	1.09	2.32	4.20	3.28

Source: IBGE, made by the Central Bank.

1/ BRA (Brasília), GOI (Goiânia), RMB (RM Belém), RMBH (RM Belo Horizonte), RMC (RM Curitiba), RMF (RM Fortaleza), RMPA (RM Porto Alegre), RMR (RM Recife), RMRJ (RM Rio de Janeiro), RMS (RM Salvador), RMSP (RM São Paulo).

2/ Statistics for labor have been calculated considering the initial July/2006 period, when the subgroup came into being.

The service inflation was higher than the respective general indices in all the regions researched, according to Table 2. The prices behavior was

Table 2 – Regional IPCA, services and ex-services

Region	Annual average variation – Mar/2004 to Feb/2011 (% p.y.)			Relative prices ^{1/}
	IPCA	IPCA Services	IPCA Ex-services	
RM Curitiba	5.14	7.28	4.52	2.64
Brasília	5.33	7.10	4.73	2.27
RM Fortaleza	5.05	6.92	4.69	2.13
RM Salvador	5.22	7.04	4.86	2.08
Goiânia	5.20	6.85	4.76	2.00
RM Belo Horizonte	6.06	7.71	5.69	1.91
RM Porto Alegre	5.21	6.59	4.86	1.66
RM Recife	5.40	6.71	5.21	1.43
Brasil	5.32	6.45	5.06	1.32
RM Belém	5.87	6.69	5.75	0.89
RM Rio de Janeiro	5.26	5.94	5.13	0.77
RM São Paulo	5.16	5.80	5.04	0.73

Source: IBGE, made by the Central Bank.

1/ Ratio between the geometric factor corresponding to the annual average variation of service prices altogether and that corresponding to the annual average variation of the set of the other prices forming the IPCA.

regionally heterogeneous and the relative prices change was lower in the metropolitan regions of São Paulo, Rio de Janeiro and Belem, and more relevant in Curitiba, Brasília, Fortaleza and Salvador.

The average services inflation was highest in Belo Horizonte, 7.71%, with emphasis on the rates related to the items domestic servant, 11.37%; leisure, 9%; and personal care, 8.33%. The expenses with education registered expressive annual average rises in the metropolitan regions of Recife, 7.9%; Fortaleza, 7.77%; and Salvador, 7.27%. Only São Paulo and Rio de Janeiro registered services prices average variations lower than the national average.

The divergences in the prices changes in each region may be decomposed, primarily, in price effect⁶ and weight effect. The first comprehends the differences in the prices variations of the same service, due to local specificities and restrictions to mobility of factors. The weight effect corresponds to part of the differentials between the regional inflation rates due to the relative participation of several services of the index basket composition in each region.

Table 3 – Relative contribution (estimated) of the weight-effect and of the price-effect for the differential between the regional and national differences of the IPCA-services

Region	Mar/2004 to Feb/2011			
	Annual average variation	Difference (p.p.)	Weight-effect (%) ^{1/}	Price-effect (%) ^{1/}
Brasil	6.45			
RM Belo Horizonte	7.71	1.26	12.1	87.9
RM Curitiba	7.28	0.84	6.7	93.3
Brasília	7.10	0.66	26.4	73.6
RM Salvador	7.04	0.60	-3.4	103.4
RM Fortaleza	6.92	0.48	93.4	6.6
Goiânia	6.85	0.40	6.8	93.2
RM Recife	6.71	0.26	93.4	6.6
RM Belém	6.69	0.25	95.8	4.2
RM Porto Alegre	6.59	0.15	86.6	13.4
RM Rio de Janeiro	5.94	-0.50	-5.9	-94.1
RM São Paulo	5.80	-0.65	-34.1	-65.9

Source: IBGE, made by the Central Bank.

1/ Relative estimated contribution of the weight-effect and the price-effect to the differences between regional and national variation rates of the IPCA-services.

6/ Check the study “Differences between the Regional IPCAs in 2007”, presented in the Regional Newsletter of the Central Bank of Brazil published on April 2008.

Focusing on services inflation, starting from subgroups' variations and adopting the national index⁷ as reference, it was performed estimations of the differential decomposition between the services prices variations of each region and of the country in weight effect and price effect, according to Table 3. The price effect's importance replaced the weight effect one, e.g., it overcame 50% in module, in seven of the eleven regions researched, including four that registered the highest services inflations during the period (Belo Horizonte, Curitiba, Brasília and Salvador) and two with the lowest rates (São Paulo and Rio de Janeiro). These results point out to behaviors regionally different between similar services prices as the main elements of the spatial differences of services' IPCA. Only in Salvador both effects presented opposite pattern.

At last, the services mean inflation, with respect to the period from March 2004 to February 2011, overcame the IPCA variation in all the regions researched. This performance occurred heterogeneously, registering sharper variations in Belo Horizonte, Curitiba and Brasília, and lower variations in São Paulo and Rio de Janeiro. The regionally distinct behaviors between similar services prices (price effect) were responsible for the greatest part of the spatial differentials in the services' IPCA.

7/ It is observed that, since the national index consists of weighted average of regional indices, the differences between the regions' and the country's rates tend to, at first, be reduced in the regions with greater weight in the national index.

Real Estate Price Indices: methodology and use in the Brazilian economy

The repercussions of the Brazilian economy recent expansion on real estate demand and on the trajectory of prices applied in the real estate internal market has stimulated a growing interest for indicators of real estate prices in Brazil. In this context, this box discusses methodological aspects regarding the calculation of real estate price indices and presents some indicators recently produced in Brazil.

It is important to emphasize that the construction of such indices must take into account the underlying aspects of these assets. Thus, their own structural characteristics and the properties' unique location constitute a homogeneity problem. Furthermore, the restrictions imposed to these indices by the sporadicness with which the transactions involving real estate occur and by the availability of data that enable to identify the transaction value, are evident.

According to the Statistical Office of the European Communities (Eurostat) (2011), there are four methods to calculate real estate price indices: stratification, repeat sales, evaluation, and hedonic regression. Clearly, each method incorporates relative advantages and the choice of the most appropriate one will depend on the index purpose and on data availability.

The repeat sales index is calculated only with properties that are sold at least for the second time, comparing sale price variation, but presents three main disadvantages. This method does not consider alterations in the real estate quality, due to renovations, and, therefore, even comparing the price of the same property, it is possible that the index may be impacted by changes in the property's characteristic and not only variations in prices.

Besides, this method rules out all the properties sold for the first time. Finally, this index may bring an important bias, if the most frequently transacted properties are not a representative sample of the overall properties on which the indicator's interest falls on.

The evaluation method, while considering real estate market quotes, enables to use all the properties of the sample, and not only those sold more than once, and its results may always be reviewed when new information is added. Although this method extends the sample used, its quality depends on the evaluations' strictness and still evinces the inability to grasp changes in the quality of real estate.

The stratification method divides the sample into strata according to the observed criteria, such as geographic region, number of rooms or bedrooms, property age, among others. From this division, measures of prices are calculated (usually average or median) that, when weighted, bring about an aggregate indicator. If the stratification incorporates relevant characteristics, the method allows identifying most part of the changes in the property's quality throughout time, being considered an acceptable index. The other advantage of the index is its ease to be used, while, on the contrary, the restricted stratification may provide small samples or even lack of observations in some strata.

The hedonic regression method requires data regarding real estate prices and information about its attributes, using, as from this basis, statistical techniques of regression. The prices are considered dependent variables and the attributes and dummies (binary variables) of a period, explanatory variables. Starting from these dummies it is possible to calculate a price index in which the property quality (which certainly depends on which other regressors are included in the model) remains constant¹. Even though this method is, probably, the most efficient one, it requires information about attributes, reproduction difficulty and, depending on the technical specifications chosen, restrictions for the results revision.

1/ Check the study "Differences between the Regional IPCAs in 2007", presented in the Regional Newsletter of the Central Bank of Brazil published on April 2008.

While in several economies, especially the more developed ones, there are representative series of real estate price indices; its construction in Brazil is still beginning, encouraged by construction and real estate credit trajectories. The main indices of this nature in the country are those indicators elaborated by the Institute of Economic Research Foundation (Fipe) and by Getulio Vargas Foundation (FGV), both published on February 2011.

The Fipe Zap Index of Advertised Property Prices (Index Fipe Zap) is based on offer prices of apartments. Its data base is Zap records, a private company specialized in classified advertisements, and its calculation method is the stratification, which comprehends the apartment's location (region of the municipality) and the respective number of bedrooms. In each stratum, it is calculated the median of prices (in R\$/m²) of the observations (offer advertising). In each city, the index (known as regional) corresponds to the weighted average of the price medians of the respective strata. The weighting variable used is the aggregate family income, per stratum, according to data from the 2000 Demographic Census, which provides a price index for the stock of apartments.

The Fipe uses the same weighting criteria for the calculation of indices regarding each class of number of bedrooms, as well as for the Fipe Zap Composite Index, the national aggregate as of seven metropolitan regions². The main index qualities are the data base amplitude, which surpassed one thousand observations per month last December, enabling enough information in each stratum, and its timeliness – the indicator is published about one week after the end of the reference month. One disadvantage of the index is the use of the offer price and not the price of sale, emphasizing that, if this relation is relatively stable, such deficiency is no longer relevant for the analyses of relative evolution of real estate prices.

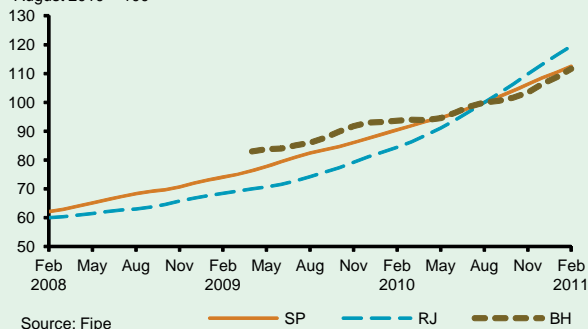
The first results turned in by Fipe support the perception that there has been a significant rise of real estate prices in the country. The indices referring to Rio de Janeiro and São Paulo presented increases of 99.3% and 81.3%, respectively, within the period

2/ São Paulo, Rio de Janeiro, Belo Horizonte, Federal District, Recife, Fortaleza and Salvador.

Figure 1 – FipeZap^{1/} index

Selected regions

August 2010 = 100

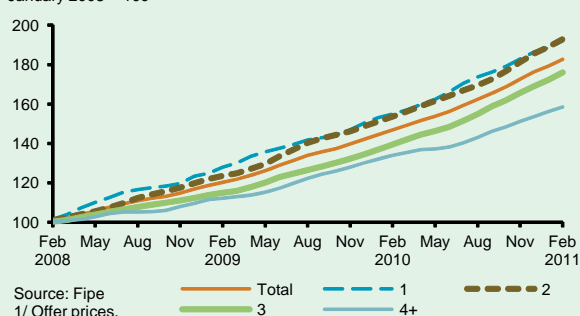


Source: Fipe
1/ Offer prices of apartamentos.

Figure 2 – FipeZap index by number of bedrooms^{1/}

São Paulo

January 2008 = 100

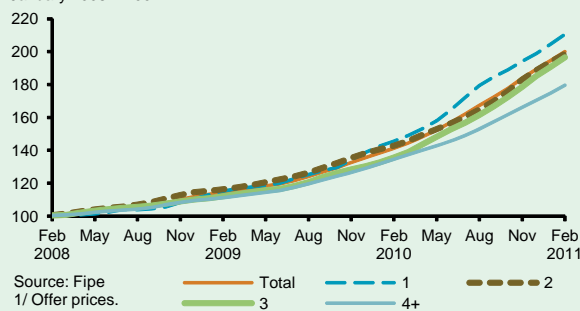


Source: Fipe
1/ Offer prices.

Figure 3 – FipeZap index by number of bedrooms^{1/}

Rio de Janeiro

January 2008 = 100

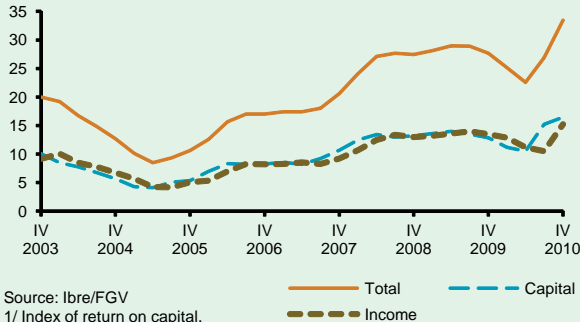


Source: Fipe
1/ Offer prices.

Figure 4 – Total IGMI-C and components^{1/}

Brasil

Variation over the same quarter of the previous year



Source: Ibre/FGV
1/ Index of return on capital.

of 36 months ended on February 2011, while the index referring to Belo Horizonte increased 29.7% within the period of 18 months ended in the same month, according to Figure 1. In the same figure it is still evident the recent acceleration of real estate prices growth rate in Rio Janeiro when compared to the other two capitals.

It must be pointed out that the prices of one and two-bedroom apartments increased more sharply than those with three and four bedrooms or more. In São Paulo, the biggest market analyzed, the indices regarding one and two-bedroom apartments increased 89.2% and 91.1%, respectively, within the period of 36 months ended on February 2011, while the prices of three and four-bedroom apartments expanded 75.4% and 58%, respectively (Figure 2). This trend has also been observed in Rio de Janeiro (Figure 3).

The General Real Estate Market Index – Commercial (IGMI-C) of FGV is a profitability indicator of the real estate business, displayed in two components – income return and capital return –, besides its aggregate form. The first one corresponds to the ratio between net operational revenue (total of business revenues minus operational expenditures) and the enterprise assessed value. The capital return is defined as the ratio between the real estate appreciation and its assessment in the previous period. The total return is just the addition of both. The basic information consolidated in IGMI-C is obtained from companies connected to the real estate sector, such as institutional investors, property developers, class entities, consultants, administrators and managers of property portfolios. The series periodicity, which could be retroactive to the first quarter of 2000, has a quarterly periodicity. In the last 2010 quarter, the sample comprehended 190 individual real estates, mostly formed by commercial offices concentrated in São Paulo (37%) and Rio de Janeiro (26%). The indicator growth is shown in Figure 4 and evinces a relevant rise in the last quarter, when the total return regarding the corresponding period of 2009 reached 33.5%, the highest variation of the series.

In general, it is possible to say, with the exceptions mentioned, that real estate price indices corroborate the perception regarding the real estate market acceleration in the country. It is important to consider

that the indicator trajectory bears some limitation due to the low number of observations made, making it difficult to distinguish transactions related to the business cycle from those with a trendy nature.