

**2000 Base Corporate Goods Price Index
Hedonic Regression Model for Quality Adjustment¹
–Digital Cameras–**

The Bank of Japan compiles the index of “digital cameras” in the 2000 base Corporate Goods Price Index (CGPI). When the sample prices of this commodity surveyed for compilation of the index are replaced, the quality difference between old and new sample prices are adjusted by the hedonic regression method.² The Bank updated the hedonic regression model. The details of the estimation are as follows.

- I. The price data for digital cameras are retail prices at the large-size household electrical appliance retailers of all parts of Japan, taken from a Point-of-Sales (POS) data from GfK Marketing Services Japan Ltd.
- II. Spec. data for each product are taken from the GfK data base and brochures of the products.
- III. The sample range for analysis is the last eight quarters, and the number of the observations is 209. The data from 2005/Q3 to 2007/Q2 are used to estimate the hedonic regression model, which is adopted from August 2007 for the CGPI. When the observations include the data of the same products as shipped in consecutive quarters, the first data is selected.³

¹ For more detail, see the “Explanation of Corporate Goods Price Index (CGPI)” on the Bank of Japan (BOJ) website, <http://www.boj.or.jp/en/theme/research/stat/pi/cgpi/index.htm>.

² The hedonic regression method is one of the quality adjustment methods. This method is used to calculate the part of the price changes that correspond to the change in quality accompanying the shift to the new sample prices.

³ The sample price of CGPI is usually replaced by the price of corresponding new product soon after its release. Therefore, use of first observation of the data to estimate may be the best corresponding to quality adjustment of the sample price.

Estimation Result for Digital Cameras

	2005/3Q-2007/2Q	(Ref.) 2005/1Q-2006/4Q
Box-Cox Parameter	0.372	0.644
Estimated Model	Box-Cox Model	Box-Cox Model
Intercept	-675.952 ***	-37225.4 ***
LCD Size (inches)	0.336 ***	0.886 ***
Box-Cox Parameter	4.822	6.234
Effective Pixels of Pictures (10k pixels)	311.501 ***	23850.7 ***
Box-Cox Parameter	-0.342	-0.610
Optical Zoom (times)	2.854 ***	292.807 ***
Box-Cox Parameter	0.814	-0.510
Min. Focal Length (35mm Equivalent)	-0.004 ***	--
Box-Cox Parameter	2.498	
Macro Focus Distance (cm)	--	-425.016 *
Box-Cox Parameter		-8.236
Battery Type		
Lithium-ion Battery	--	215.203 ***
Shake Reduction		
Optical / Mechanical	4.297 ***	--
Weight		
over 300g	--	286.443 ***
Waterproof	12.355 ***	120.234 **
Movie Mode		
MPEG4	20.886 ***	138.588 **
ISO Rating		
over 1600	6.920 ***	--
Cradle	7.118 ***	--
CCD Size		
over 1/1.8	--	63.310 **
Dummy for Producer		
Producer A	5.600 ***	52.677 **
Producer B	-4.547 ***	-120.690 ***
Producer C	33.813 ***	564.343 ***
Producer D	--	-55.948 **
Dummy for Period		
2005/4Q	-4.120 **	
2006/1Q	-12.786 ***	
2006/2Q	-11.597 ***	
2006/3Q	-20.511 ***	
2006/4Q	-18.962 ***	
2007/1Q	-28.014 ***	
2007/2Q	-29.755 ***	
(Ref.) Dummy for Period (Previous estimation)		
2005/2Q		--
2005/3Q		-114.011 ***
2005/4Q		-147.946 ***
2006/1Q		-259.195 ***
2006/2Q		-226.052 ***
2006/3Q		-338.341 ***
2006/4Q		-318.151 ***
Adjusted R ²	0.763	0.790
Standard Error of Regression	8.194	259.975
Mean of Dependent Variable	127.386	1344.720
Number of Observations	209	195

Notes:

1. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.
2. The coefficients estimated above are White heteroscedasticity consistent estimator.