June 2016

Hedonic Regression Model for Quality Adjustment in the Corporate Goods Price Index
- Video Cameras -

To account for price changes with the quality being constant, quality adjustments between old and new sample prices need to be done.   The Bank of Japan employs various quality adjustment methods and hedonic regression method is one of them[1].

The Bank has updated the hedonic regression model for video cameras.   See the appendix for the result. This hedonic regression model is used for "Video cameras" (Producer Price Index) and "Video cameras & digital cameras" (Export Price Index and Import Price Index).

The details of samples for the estimation are as follows.

I.   The price data for video cameras are taken from "BCN Ranking," the BCN Inc. database.   The price data are retail prices at the large-size electrical appliance retailers and exclude action cameras.
II.   Specifications for video cameras are taken from the "BCN Ranking" and the brochures.
III.   The number of the observations for video cameras is 67.   The data from 2013/Q2 to 2016/Q1 are used to estimate the hedonic regression model, which are adopted from May 2016 for the quality adjustment.

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[1] For more details, see the Outline of the Corporate Goods Price Index (CGPI, 2010 base) on the Bank's website.

Estimation Result for Video Cameras

	2013/Q2-2016/Q1	(Ref.)2013/Q2-2015/Q1
Estimated Model	Double Box-Cox Model	Double Box-Cox Model
Box-Cox Parameter of Dependent Variable	0.490	0.197
Intercept	377.667 ***	-4562.456 ***
Effective Pixels of Moving Pictures (10k pixels)	--	6199.820 ***
Box-Cox Parameter		-1.347
Media Storage Capacity (Embedded, GB)	10.037 ***	0.344 ***
Box-Cox Parameter	0.456	0.200
Image Sensor Size (square millimeters)	0.184 ***	--
Box-Cox Parameter	1.487	
Dummy Variables		
Image Sensor		
1 inches (one sensor)	--	5.228 ***
three sensors	402.614 ***	11.652 ***
LCD Size		
not less than 3.5 inches	82.286 **	--
LCD Viewfinder	94.176 ***	3.472 **
Double Slots	313.758 ***	7.520 ***
4K	111.463 ***	4.475 ***
Action Camera	--	-3.294 ***
Touch Screen Display	41.870 **	--
Period		
2013/Q3	126.363 *	5.121
2013/Q4	-29.045	-1.685
2014/Q1	-70.425 **	-0.729
2014/Q2	-279.334 ***	-7.905 ***
2014/Q3	-68.293	0.195
2014/Q4	-84.179 **	-2.143
2015/Q1	-79.100 **	-0.653
2015/Q2	-101.967 **	--
2015/Q3	--	--
2015/Q4	-104.807 ***	--
2016/Q1	-106.045 ***	--
R^2	0.973	0.920
Adjusted R^2	0.963	0.894
Standard Error of Regression	42.917	2.332
Mean of Dependent Variable	528.585	38.667
Number of Observations	67	61

Note: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.