October 2016

Hedonic Regression Model for Quality Adjustment
in the Corporate Goods Price Index and the Services Producer Price Index
- Tablet Computers -

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 tablet computers.   See the appendix for the result.   This hedonic regression model is used for "Notebook computers" (Producer Price Index, Export Price Index, and Import Price Index) and "Computer rental" (Services Producer Price Index).

The details of samples for the estimation are as follows.

I.   The price data for tablet computers are taken from "BCN Ranking," the BCN Inc. database.   The price data are retail prices at the large-size electrical appliance retailers.

II.   Specifications for tablet computers are taken from the "BCN Ranking" and the brochures.

III.   The number of the observations for tablet computers is 86.   The data from 2015/Q3 to 2016/Q2 are used to estimate the hedonic regression model, which is adopted from September 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) and the Outline of the Services Producer Price Index (SPPI, 2010 base) on the Bank's website.

(Appendix)

Estimation Result for Tablet Computers

	2015/Q3-2016/Q2	(Ref.) 2015/Q1-2015/Q4
Estimated Model	Double Box-Cox Model	Double Box-Cox Model
Box-Cox Parameter of Dependent Variable	0.486	0.474
Intercept	-325.459 ***	-316.936 ***
Main Memory (MB)	--	54.791 ***
Box-Cox Parameter		2.393E-03
Display Size (inches)	0.158 ***	0.207 ***
Box-Cox Parameter	2.920	2.698
Display Resolution (pixels)	9.138E-03 ***	1.740E-07 ***
Box-Cox Parameter	0.597	1.314
Solid State Drive (GB)	28.880 ***	16.081 ***
Box-Cox Parameter	0.160	0.229
Battery Life (hours)	410.024 ***	10.748 ***
Box-Cox Parameter	-0.976	0.602
Dummy Variables		
CPU/OS		
Core M	39.865 *	37.885 **
Windows 8.1 Pro 64bit version or Windows 8.1 Pro Update 64bit version or Windows 10 Pro 64bit version	--	61.756 ***
Main Memory		
not less than 2GB	53.949 ***	--
Display Type		
IGZO Display	132.257 ***	--
Standard Accessory		
Keyboard	--	33.154 ***
Keyboard for less than 10.5-inch display model	29.874 ***	--
Keyboard for not less than 10.5-inch display model	60.635 ***	--
Stylus Pen	57.477 ***	--
Producer		
Producer A	--	51.654 *
Producer B	58.194 ***	80.180 ***
Producer C	201.360 ***	118.181 ***
Producer D	344.514 ***	--
Producer E	-59.483 ***	--
Period		
2015/Q2	--	-2.406
2015/Q3	--	12.585
2015/Q4	4.548	10.660
2016/Q1	38.558 ***	--
2016/Q2	-41.732 ***	--
R^2	0.984	0.960
Adjusted R^2	0.980	0.954
Standard Error of Regression	25.058	29.175
Mean of Dependent Variable	441.003	346.618
Number of Observations	86	102

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