March 2016

Hedonic Regression Models for Quality Adjustment
in the Corporate Goods Price Index and the Services Producer Price Index
- Servers -

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 servers.   See the appendix for the result.   This hedonic regression model is used for "Servers" (Producer 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 servers are taken from "Japan Server Market Study," the IDC Japan database.
II.   Specifications for servers are taken from the "Japan Server Market Study."
III. The number of the observations for servers is 140.   The data from 2014/Q2 to 2015/Q3 are used to estimate the hedonic regression model, which is adopted from February 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.

Estimation Result for Servers

	2014/Q2-2015/Q3	(Ref.)2013/Q2-2014/Q3
Estimated Model	Double Box-Cox Model	Double Box-Cox Model
Box-Cox Parameter of Dependent Variable	0.159	0.237
Intercept	-175.806 ***	-95.572 ***
Processors/Standard Supported Quantity	5.461 ***	16.396 ***
Box-Cox Parameter	0.507	-0.143
Cores/Processor	1.965 ***	3.413 ***
Box-Cox Parameter	0.509	0.326
Main Memory (MB)	--	36.330 ***
Box-Cox Parameter		-0.153
Main Memory/Core (MB)	89.613 ***	--
Box-Cox Parameter	-0.406	
Dummy Variables		
Processor Type		
Intel XeonE5-4600	--	12.094 **
Intel Celeron	-3.072 ***	--
Redundancy		
PSU	1.467 **	--
FAN	0.660 **	--
Producer		
Producer A	--	-3.473 ***
Producer B	-1.609 ***	-12.594 ***
Period		
2013/Q3	--	-6.784 *
2013/Q4	--	-7.761 **
2014/Q1	--	-8.049 **
2014/Q2	--	-7.677 *
2014/Q3	1.084 **	-5.888
2014/Q4	5.318 ***	--
2015/Q1	6.503 ***	--
2015/Q2	--	--
2015/Q3	4.306 ***	--
R^2	0.956	0.858
Adjusted R^2	0.952	0.845
Standard Error of Regression	1.141	5.789
Mean of Dependent Variable	49.295	94.474
Number of Observations	140	132

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