Danmarks Statistik
MODELGRUPPEN

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Level Correction – October 2014 model version

Resumé:

This note explains the level correction in okt14 model version due to the change in the base year price. The base year is changed from 2005 in the earlier model version – jun14 to 2010 in the present model version – okt14.

DSI

Keywords: level correction, base year

1. Introduction

There has been a major revision in the national accounts since September 2014 – a change in sector definition, a new assessment of the public finances and others – see TMK150914 for more. There is also a shift in the base year price from 2005 to 2010. It means that the behavioral relations in okt14 model version have to be re-estimated. The base year change shifts the level of a series and affects only the constant term in the long term relations. On the other hand, a data revision, for example due to a change in sector definition, can change both the level and growth rates of a series. This will affect the constant and slop coefficients both in the long and short term relations.

Currently, updated data is available only for 2005-2010, which is not long enough for re-estimation. Practically, it is also difficult to re-estimate all the stochastic relations in ADAM given the short time available between the old model version - jun14 and the release of the new model version - okt14 with the new national accounts. For these reasons, we only correct the level in the long-term relations based on the period 2005-2010. We abstain from correcting the constants in the short term relations; because the new data (2005-2010) includes the world-wide recession year 2008/2009 and calculating growth rates based on the short sample can provide a misleading figure. The following section explains the level correction.

2. The correction

Consider a typical error correction equation with a base year in 2005

$$\log(Yw) = \sum_{i=1}^{n} \beta_i \log(X_i) + KYw \tag{1a}$$

$$d\log(Y) = \sum_{i=1}^{n} \alpha_i d\log(X_i) - \gamma \log(Y_{-1} / Yw_{-1}) + gy \tag{1b}$$

and with a base year in 2010

$$\log(Yw^1) = \sum_{i=1}^{n} \beta_i^1 \log(X_i^1) + KYw^1 \tag{2a}$$

$$d\log(Y^1) = \sum_{i=1}^{n} \alpha_i^1 d\log(X_i^1) - \gamma^1 \log(Y_{-1}^1 / Yw_{-1}^1) + gy^1 \tag{2b}$$

If we assume $\beta_i \approx \beta_i^1, \alpha_i \approx \alpha_i^1$ for $i=1,..,n$, the constant term in the long term relation can be updated so that on average $Y^1 / Yw^1 \approx Y / Yw$. This is because the change in the national accounts is a base year change and not a real change in the measure of economic variables. The long term constant is updated as follow.[1]

[1] An alternative is to estimate only the constant terms, updating the constants in this way is preferred for practical reasons.

$$Yw^1 = \exp(\sum_{i=1}^{n} \beta_i \log(X_i^1) + KYw) \quad (3a)$$

$$k - factor = mean(Y^1 / Yw^1) / mean(Y / Yw) \quad (3b)$$

$$KYw^1 = KYw + \log(k - factor) \quad (3c)$$

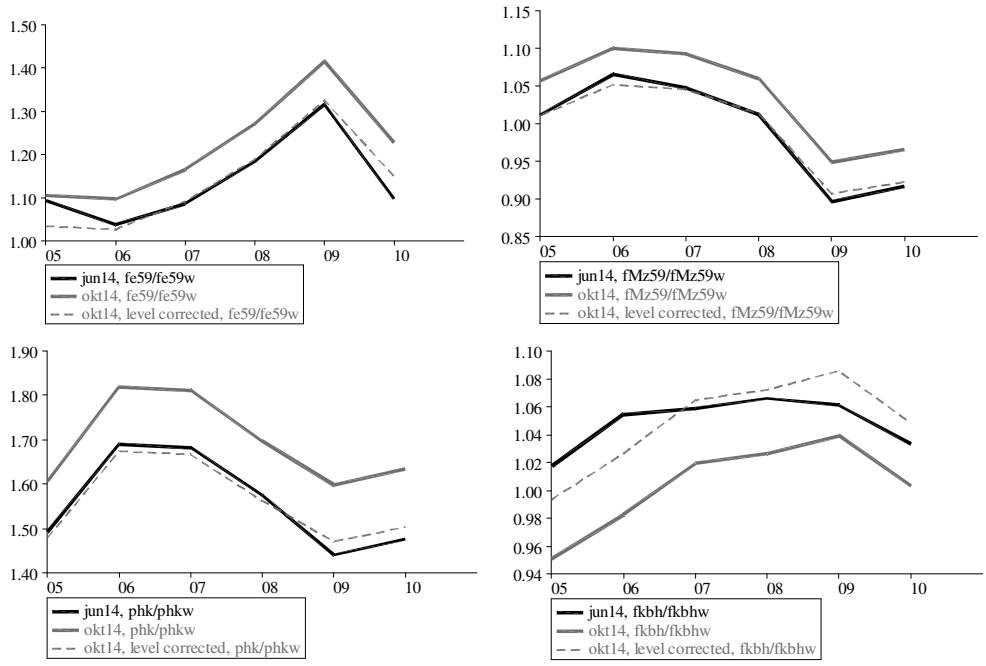
The constant term in the short term relation can be recalculated as:

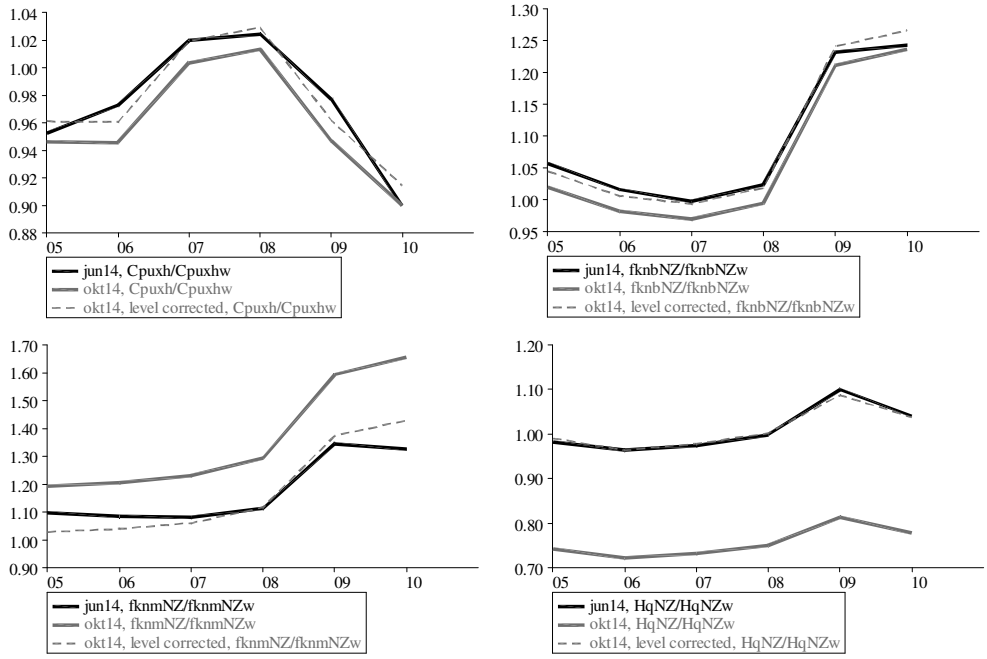
$$gy^1 = mean[(d\log(Y^1) - \sum_{i=1}^{n} \alpha_i^1 d\log(X_i^1)]$$

since $mean(\log(Y_{-1}^1 / Yw_{-1}^1)) = 0 \quad (4)$

However, based on a scrutiny of some short term relations, we refrained from recalculating the short term relations for the reasons mentioned above. Figure 1 shows the extent of the level correction for selected relations.

Figure 1. Selected long term relations – model version jun14 and okt14





For the most part, the difference between the long term relations in *jun14* and *okt14* model is a level difference, however, some differences in growth rates are also visible.

Table 1 provides a review of the constant terms in the long term relations before and after the level correction.

Table 1. Constant terms in the long term relations – model version jun14 and okt14

Exports

Long term relation	*jun14*	*okt14*
fe2kw	9.768	10.025
fe59w	12.600	12.666
fetw	10.398	10.400

Imports, volume and price

Long term relation, volume	*jun14*	*okt14*	Long term relation, price	*jun14*	*okt14*
fmz01w	9.445	9.528	*pm3rw*	-0.020	-0.010
fmz2w	9.326	9.361	*pm3kw*	0.044	-0.150
fmz59w	12.307	12.352	*pm3qw*	0.007	-0.022
fmzsw	11.153	11.251			

Wage, macro consumption, housings

Long term relation	*jun14*	*okt14*
bulbw	-0.336	-0.336
cpuxhw	-0.201	-0217
fkbhw	0.889	0.826
phkw	0.670	0.665
nbs	1.500	1.700

Consumption system

Long term relation	*jun14*	*okt14*
bfcguw	-3.461	-3.362
bfcbuw	-2.663	-2.717
bfcew	-2.689	-2.553
bfcfw	-1.757	-1.753
bfcvw	-1.460	-1.523
bfctw	-2.997	-3.187
bfcsw	-0.911	-0.874

Output prices

Long term relation	*jun14*	*okt14*
pxbw	-0.031	-0.001
pxnew	0.026	-0.043
pxnzw	-0.015	-0.001
pxqfw	0.210	0.258
pxqzw	-0.004	0.015

Factor block

Sector	Model	input				
		Energy	Material	Building	Machinery	Labour
a	*Jun14*	-2,327	-0,524	0,884	-0,137	-6,084
	Okt14	-2,535	-0,375	0,720	-0,271	-6,359
nf	*Jun14*	-3,831	-0,326	-1,213	-2,471	-3,644
	Okt14	-3,724	-0,259	-1,073	-2,551	-3,885
nz	*Jun14*	-3,792	-0,513	-1,365	-1,580	-5,379
	Okt14	-3,862	-0,498	-1,389	-1,433	-5,661
b	*Jun14*	-3,810	-0,519	-2,254	-2,250	-4,684
	Okt14	-3,538	-0,501	-2,261	-2,476	-4,811
qz	*Jun14*	-3,700	-0,763	-0,432	-1,350	-4,540
	Okt14	-3,676	-0,723	-0,601	-1,449	-4,702
qf	*Jun14*	-5,361	-0,927	-1,419	-1,788	-6,799
	Okt14	-5,215	-1,085	-1,812	-1,827	-7,022
ne	*Jun14*	-1,197	-1,882	0,870	-0,991	-7,727
	Okt14	-0,941	-1,666	0,998	-0,828	-7,933
qs	*Jun14*	-2,150	-0,430	-2,319	-0,261	-8,501
	Okt14	-1,616	-0,405	-1,376	-0,466	-8,788
ng	*Jun14*	-0,097	-2,561	-2,024	-1,511	-9,916
	Okt14	-0,097	-2,647	-1,568	-1,963	-9,936

Property tax

	Jun14	*Okt14*
spzejw	0.229	0.204