

WORKSHOP ON LABOUR FORCE SURVEY METHODOLOGY

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DATA PROCESSING AND DATA QUALITY

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G. Data quality: Quality issues on monthly figures, timeliness and consistency between quarterly and monthly data

G4 – A description of the procedures for consistency between monthly, quarterly and annual figures in Swedish LFS, including our publishing's calendar

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Quarter and annual estimates in Swedish LFS¹

Background

Since 1970 the Swedish LFS has been conducted on a monthly basis. During one quarter the sample consists of three separate samples, one for each month. LFS is panel survey with rotation sample. The rotation scheme is so constructed that 7/8 of each of the three sample recur after three month.

The monthly sample during 1970-1992 consisted of two consecutive, holiday free weeks (reference weeks). The sample is distributed uniformly on the reference weeks.

The data collection, CATI since 1990, starts on Monday after the reference week. The respondent gets a reference to the week which the respondent belongs to in the sample.

Given these condition the quarterly and annual estimates is a function of the monthly estimates. A quarterly estimate/figure is obtained as a simple average of the monthly estimate within the quarter.

$$\hat{t}_q = \frac{1}{3} \sum_{m=1}^3 \hat{t}_m \quad (1)$$

Where \hat{t}_q is an estimate of a quarter and \hat{t}_m is an estimate of month m.

The annual estimates can be written:

$$\hat{t}_a = \frac{1}{12} \sum_{m=1}^{12} \hat{t}_m = \frac{1}{4} \sum_{q=1}^4 \hat{t}_q \quad (2)$$

(1) and (2) gives consistency monthly, quarterly an annual figures.

LFS 1993-

Since January 1993 the LFS includes all weeks in the year.

The meaning of the new week system is following:

- I) LFS measures the situation of the target population on the labour market every week of the year, a year contain 52 weeks (53 weeks every 7th year). The fact that LFS: s

¹ This paper is mainly a translation, to English, of: Mirza, Hassan, Kvartals- och årsskattningar. PM 1996-11-14.

reference periods are whole weeks and that the numbers of weeks of one year are not dividable with 12 implicates that "LFS month" has different numbers of reference weeks.

Table 1 show that LFS has got four reference weeks during the two first months, and five during the last month in every quarter. One exception is for years with 53 weeks then the fourth quarter has got 5, 4, 5 weeks.

Table 1: number of reference week

Quarter	"LFS month"	Year	
		normal year	With 54 weeks
1	January	4	4
	February	4	4
	Mars	5	5
2	April	4	4
	May	4	4
	Jun	5	5
3	July	4	4
	August	4	4
	September	5	5
4	October	4	5
	November	4	4
	December	5	5

II) Nowadays, because of the new week system, LFS masseurs the reel condition in the labour market. The system also captures the effects of seasonality, holy days etc. It also captures the effect of extraordinary events such as strikes and pandemics.

The conditions that are listed under I) and II) implicates that the quarterly estimates should be calculated in such way that every moth gets a weight which is in proportion to the number of weeks in it.

Consequently quarterly estimates will be obtained by:

$$\hat{t}_q = \frac{4}{13}(\hat{t}_j + \hat{t}_{j+1}) + \frac{5}{13}\hat{t}_{j+2} \quad (3)$$

$$q = 1, 2, 3, 4 \quad och \quad j = 1, 4, 7, 10$$

(3) is valid for quarterly estimations if it is :

- a normal year (a year with 52 weeks)
- the first three quarters in a year with 53 weeks.

For the fourth quarter during a year with 53 weeks following is valid instead:

$$\hat{t}_q = \frac{5}{14}(\hat{t}_j + \hat{t}_{j+2}) + \frac{5}{14}\hat{t}_{j+1} \quad (4)$$

The annual estimates can be written as:

$$\hat{t}_a = \frac{1}{4} \sum_{q=1}^4 \hat{t}_q \quad (5)$$

Table 2 shows the quarterly estimates of the employment, at work i.e. no absences and the number of hours actual worked. The estimates are obtained in columns 3-5 by formula (1) and in columns 6-8 by formula (3). Column 9 shows that there is not a significant difference in the estimate of employment using (1) or (3). While you find a significant bias in estimates of number of person at work, column 10, and in the estimate of hours actual at worked, column 11, if one use formula (1) instead of (3).

Table 2

		According to formula (1)=t1			According to formula (3)=t3			Bias=(1-(t1/t3))*100		
Kol.	2	3	4	5	6	7	8	9	10	11
		Employ- ment.	At work.	Hour of actual work.	Employ- ment.	At work.	Hour of actual work.	Employ- ment.	At work.	Hour of actual work.
Year	Quarter	thousand	thousand	million	thousand	thousand	million	thousand	thousand	million
1993	1	3 982,9	3 506,4	127,8	3 982,5	3 506,9	128,0	-0,01	0,01	0,16
	2	3 986,8	3 435,8	121,0	3 992,5	3 426,1	120,8	0,14	-0,28	-0,22
	3	3 990,9	2 831,8	107,2	3 986,5	2886	109,2	-0,11	1,88	1,91
	4	3 894,3	3 448,6	126,1	3 895,6	3 437,7	125,2	0,03	-0,32	-0,74
1994	1	3840	3 420,7	124,5	3843	3 424,1	124,6	0,08	0,10	0,07
	2	3 938,9	3 450,1	124,7	3 947,7	3 444,3	124,8	0,22	-0,17	0,05
	3	3 996,1	2 868,6	108,5	3 991,4	2923	110,7	-0,12	1,86	1,93
	4	3 930,9	3 523,1	131,2	3 929,9	3 513,4	130,5	-0,03	-0,28	-0,56
1995	1	3 901,2	3 501,8	130,2	3 900,9	3 502,6	130,5	-0,01	0,02	0,16
	2	4 019,4	3 548,6	124,3	4 024,4	3 542,7	124,3	0,12	-0,17	0,03