Process and Analyse
Session 2.3. Labour market issues

Model based hours worked

23 August 2022

Introduction

- General interest in hours worked

- Is needed to calculate productivity and average hours worked

- User needs to evaluate the economy and labour market

Background

- Since 2019 Statistics Sweden receive monthly income declarations on individual level for employees (PAYE)
- Monthly statistics from this source was published for the first time in May 2022 in the new register-based labour market statistics, Population by labour market status (BAS)
- No data on hours worked in PAYE
- Users need to have estimates of hours worked from this source as well.
- Data from the short term statistics on wages and salaries has been used

Models

- Model 1 – Inverse of average renumeration per hour multiplied with the total renumeration from PAYE.

$$T_{y_{id}} = T_{x_{1id}} R^{-1}_{x_{1id}, y_{id}},$$

- Model 2 – Average working hours multiplied with number of employees from PAYE.

$$T_{y_{id}} = T_{x_{2id}} R_{y_{id}, x_{2id}},$$

Estimates from the two models, thousands

Sector	Hours worked (model 1)		Hours worked (model 2)	
	201901	202001	201901	202001
Business	376 796	362 366	384 757	373 481
Non profit org.	12 131	11 771	12 791	12 336
State	34 000	34 472	33 959	34 420
Regions	35 958	35 531	35 969	35 536
Municipalities	104 549	100 569	104 438	100 506

Models compared to National Accounts (NA) 2020

Sector	Hours worked		NA	Share	
	Model 1	Model 2	2020	Model 1	Model 2
Business	4 442	4 608	5 255	0,85	0,88
Non profit org.	145	153	163	0,89	0,94
State	408	407	427	0,96	0,95
Regions	417	417	459	0,91	0,91
Municipalities	1 146	1 146	1 318	0,87	0,87
Total	6 557	6 731	7 622	0,86	0,88

Models share per quarter, 2020

Sector	Q1 2020		Q2 2020		Q3 2020		Q4 2020	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Business	0,81	0,84	0,82	0,86	0,88	0,91	0,87	0,90
Non profit org.	0,78	0,82	0,94	0,99	0,89	0,94	0,96	1,03
State	0,97	0,97	0,89	0,89	1,00	1,00	0,96	0,96
Regions	0,91	0,91	0,86	0,86	1,02	1,02	0,86	0,86
Municipalities	0,86	0,86	0,83	0,83	0,96	0,96	0,85	0,85
Total	0,84	0,86	0,83	0,86	0,91	0,93	0,87	0,90

Growth rates 2020/2019 models and NA

Sector	Model 1	Model 2	NA
Business	-4,3	-3,6	-4,2
Non profit org.	-2,2	-2,8	-2,6
State	2,8	2,8	2,8
Regions	2,4	2,2	1,5
Municipalities	-1,8	-1,8	-2,3
Total	-3,0	-2,5	-3,1

Growth rates for the whole economy 2020/2019

Quarter	Model 1	Model 2	NA
Q1	-0,9	-0,6	-0,8
Q2	-5,1	-4,6	-5,1
Q3	-3,8	-3,4	-4,6
Q4	-2,3	-1,7	-2,3
2019/2020	-3,0	-2,5	-3,1

Number of employees, model 2 and NA

Sector	Model 2		NA		Share	
	2019	2020	2019	2020	2019	2020
Business	3 422	3 320	3 333	3 271	1,03	1,02
Non profit org.	143	132	127	127	1,13	1,04
State	272	275	265	268	1,03	1,03
Regions	297	299	304	306	0,98	0,98
Municipalities	958	938	904	893	1,06	1,05
Total	5 092	4 964	4 933	4 866	1,03	1,02

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Number of hours worked per employee 2020

Sector	Model 1	Model 2	NA
Business	1 338	1 388	1 607
Non profit org.	1 092	1 157	1 285
State	1 484	1 481	1 590
Regions	1 394	1 395	1 498
Municipalities	1 222	1 221	1 475
Total	1 321	1 356	1 566

Concluding remarks

- The purpose was to produce estimates of hours worked

- The project have produced results based on two models with rather similiar results.

- Model 1 – Inverse of average numeration per hour multiplied with total renumeration from PAYE.

- Model 2 – Average working hours multiplied with number of employees from PAYE.

- Three sources – BR, PAYE and survey of wage and salaries

Concluding remarks - NA

- Both models underestimate the number of hours worked

- Major discrepancies with NA when looking at detailed industry

  - Investigations of the differences between the sources is required

- Further investigation of the levels over hours worked in NA is required

- Growth rates rather similiar

Thank you for your attention

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