

Break in WTA on transition to eIncome

The Danish Working Time Accounts (WTA) published major revised quarterly accounts on December 13, 2012 and major revised annual accounts December 18.

The time series of the revised WTA goes back to the first quarter of 2008.

The following note describes the background and the changes that were made in the WTA at the transition to eIncome.

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1. New sources replace old sources

The reason for the revision was that the main sources of the former WTA was dropped, including the annual information from the central salary register (in Danish; det centrale oplysningssedel register, COR) previously formed the basis for the register-based labor force statistics (RAS) and the establishment-related employment statistics (ERE), as well as the previous cyclical sources monthly reports of A-income (MIA), indicators for aggregate payroll costs (based on labour market contributions for employees) and the ATP-employment statistics (based on labour market supplementary pension schemes).

These are in the revised working time account been replaced by statistics that are all based on eIncome sources - including new statements of RAS, ERE and employment statistics for employees (BFL).

The revision includes new levels for all variables in the WTA. The new time series is therefore a break with the past, because the level is now formed on the basis of the new eIncome statistics. In the previous WTA statements the latest structural data were from 2007. The revised WTA incorporates structural data for 2008 and beyond. The latest structural data from the RAS and ERE, published in the spring, are incorporated in the WTA in June of the same year.

2. Improved quality

2.1. More precise and consistent statements

It has implied far better internal consistency between the variables in the WTA to primarily build on a single source, namely eIncome. Previously a patchwork of different statistics were used.

This results in more accurate and consistent statements, both in terms of levels and developments over time. eIncome gives a much better information than those previously used sources not only regarding the of end-November levels, but also the development over the months of the years in stocks as well as volumen since eIncome information is available monthly.

The revision brings new levels for all variables in the WTA. The new time series is consequently a break with the past, because the level is now formed on the basis of the new eIncome statistics. In the previous WTA statements the latest structural data were from 2007, which meant that the series from 2008 to the second quarter of 2012 was based solely on projections. The revised WTA incorporates structural data as from 2008.

The new eIncome based data sources allows WTA to perform monthly calculations. Previously cyclical sources were available only quarterly. The fact that employee statistics are available on a monthly basis, has not only led to much better precision in development over the year, including treatment of Easter, leap year, strikes, and other effects that affects the distribution over the year. It also causes a greater precision in the seasonal adjustment of the series, including the possibility to carry out seasonal adjustment, despite the fact that the data only goes back to first of 2008, as the monthly data imply enough observations to perform seasonal adjustment.

2.2. New population and job definition

In addition to the new data sources levels are altered also because the population of the new WTA has changed. The change in population demarcation are due to, first, that people under 15 years are now included, secondly - and more importantly - now not only includes those who live in Denmark, but also those who live abroad but are taxable in Denmark. More precisely, the population is now employed workers, self-employed and assisting spouses in Danish registered companies (and not as in the Register-based Labour Force Statistics (RAS) restricted to the resident population).

A difference compared to the old WTA is (in accordance to RAS) incorporated an increase in the number of employed, as some persons on leave, formerly classified as being outside the labor force, now are included as temporarily absent from employment and thus classified as employed. These are people who are not paid during leave, but come from paid employment. In connection to the development of the Danish labour market accounts a procedure has been established to make this improved delineation of employment.

In conjunction with the transition to eIncome, the job definition applied in the private sector has been changed. Previously, a job in the Register of Employment Statistics (the annual register forming the basis for compiling the Register-based Labour Force Statistics and the Establishment-related Employment Statistics) in the private sector was defined as a person's attachment to the business enterprise. In the public sector, the job was defined as a person's attachment to a workplace. After the establishment of eIncome, the job definition is homogenous in the private

and the public sectors, as the job is now defined as a person's attachment to a workplace.

A job involving less than 1 hour of paid work per week is excluded from the job definition. The same requirement applies to the definition of persons employed, however, there is no requirement as regard the number of hours worked in relation to temporary absence. This is a definition applying internationally, and has been applied by Statistics Denmark. However, with eIncome the possibility of operationalizing this requirement has been considerable improved, as it can now be defined on the basis of information concerning paid hours of work. Previously, a minimum pay requirement was in force.

Previously, jobs in the WTA were defined on the basis of statistics compiled at the end of November as:

$$\text{Number of jobs} = \text{number of primary jobs} + \text{number of secondary jobs}$$

Where main jobs and secondary jobs were defined on the basis of employment as:

Number of primary jobs

= *Employment*

– *Number of persons on maternity leave from primary jobs*

– *Number of persons on labour market leave from primary jobs*

Number of secondary jobs

= *Number of secondary contracts of employment*

– *Number of persons on maternity leave from secondary jobs*

– *Number of persons on labour market leave from secondary jobs*

Following the revision in December 2012, jobs in addition to the person's secondary jobs are also included, implying that:

$$\text{Number of jobs} = \text{number of primary jobs} + \text{number of sideline jobs}$$

Furthermore, jobs where the person is on sickness leave are explicitly identified and are deducted from the number of jobs in the same way as jobs where the person is on maternity leave.

Number of primary jobs

= *Employment*

– *Number of persons on maternity leave from primary jobs*

– *Number of persons on sickness leave from primary jobs*

– *Number of persons on labour market leave from primary jobs*

Number of sideline jobs

= *Number of sideline contracts of employment*

– *Number of persons on maternity leave from sideline jobs*

– *Number of persons on sickness leave from sideline jobs*

– *Number of persons on labour market leave from sideline jobs*

These two effects do not have an impact on employment, but they have an impact on the number of jobs. The inclusion of all sideline jobs implies that there are a greater number of small jobs following the revision. The identification of sickness leave implies that the number of jobs has been reduced by the number of persons on sickness leave, i.e. there are fewer primary jobs and sideline jobs than previously.

In the former WTA (before the use of eIncome sources), secondary jobs for assisting spouses (about 1,000 secondary jobs in 2007) were included. In the former WTA also CRAM and AKM self-employed persons (a total of about 10,500 secondary jobs November 2007) were included. These groups of secondary jobs are

not available in the new WTA. At that time, the information was based on data that were subject to great uncertainty.

Due to the more precise dating of contracts of employment for employees in each month of the year on the basis of eIncome sources, the new WTA contain fewer employee jobs. When there are fewer employee jobs, then there are also fewer jobs as self-employed that are trumped by employee jobs in the prioritization of the person's primary employment at the end of November. Subsequently, the number of self-employed persons in employment (and assisting spouses) increases.

3. Modified method for calculating hours worked

The most important methodological changes have been made by the calculation of hours in the WTA, which is now based on the paid hours of work in eIncome, whereas the Statistics on Earnings are used for converting these hours of work into hours worked. The distribution of hours throughout the 12 months of the year is calculated by means of information on paid hours in employee statistics (BfL) during the year and hours work in the Labour Force Survey (LFS) during the year.

3.1. Employees

There was previously a problem involved in the calculation of hours worked during the year. Previously, hours worked by employees were calculated on the basis of the relational equation:

$$\begin{aligned} & \textit{Hours worked for employees} \\ & = (\textit{hours worked per job during the year}) \cdot \textit{number of jobs during the year} \end{aligned}$$

Hours worked per job during the year were calculated on the basis of the Statistics on Earnings. The problem here is that minor jobs are excluded from the Statistics on Earnings, i.e. jobs with duration of less than 1 month or less than 8 hours a week.

As the Statistics on Earnings are not compiled on the basis of a full-scale survey, hours per job were enumerated by applying the number of jobs from the Register of Employment Statistics, which contain all jobs over the year. Previously, hourly information was not available in the Register of Employment Statistics, and consequently it was impossible to assess the size of these jobs, including whether there were any bonus payments or other irregular payments or whether there were jobs with actual activity. Minor jobs were included in the number of jobs over the year from the Register of Employment Statistics.

The combination of overstated hours per job from the Statistics on Earnings with many, but also minor jobs from the Register of Employment Statistics has implied that hours worked were previously overstated.

As from the revision in 2012 hours worked for employees is instead calculated as:

$$\begin{aligned} & \textit{Hours worked for employees} = \\ & \textit{Sum of hours paid} \cdot (\textit{sum of hours worked} / \textit{sum of paid hours}) \end{aligned}$$

With eIncome we have information on paid hours of work from the employment statistics register, we can now summarize these so that small job only weighs very little. When we use the earnings statistics to convert paid hours of work to hours worked, this is not as previously dependent on the number of jobs. And despite the fact that the earnings statistics do not cover all jobs and not many working few hours of work, one must assume that the relationship between the hours worked

and paid hours in small jobs are not significantly different from the conditions prevailing in jobs where the number of working hours are large.

3.2. Self employed and assisting spouses

In connection with the publishing of statistics for 4th quarter 2012 in March 2013, the method applied in calculating hours worked for self-employed and assisting spouses has also been changed.

Previously, number of hours worked by self-employed persons (including assisting spouses) was calculated as:

$$= \text{number of jobs for self – employed} \\ \cdot \text{hours worked per job for employees in the WTA} \\ \cdot (\text{hours worked by self – employed/hours for employees}) \text{ for jobs in the LFS}$$

When annual hours for self-employed and assisting spouses were calculated in the Working Time Accounts, the basis were the annual hourly data for employees. These data were adjusted by the number of more hours worked, as stated, by the self-employed (respectively, assisting spouses) in relation to the hours worked by the employees in the Labour Force Survey. In this way, attempts are made to correct the differences in level as a result of the different types of data reports (data reported by business enterprises or by information stated by the persons in employment). Simultaneously, information on annual lengths of jobs is implicitly transferred (i.e. information on duration of jobs) from employees. Information on duration of jobs is not as such available for self-employed and assisting spouses. As self-employed and assisting spouses typically work many hours, the basis for hours worked in the main jobs was working hours for full-time employees. For the secondary jobs, it was assumed that the working time corresponded to half of the hours worked in the main jobs. When number of hours worked by employees was raised by the more number of hours worked by self-employed and assisting spouses in the Labour Force Survey, all jobs (main and secondary employment) were applied for, respectively, self-employed, assisting spouses and employees in the Labour Force Survey.

As from March 2013 the calculation has been changed (and introduced throughout the entire period as from 1st quarter 2008):

*Hours worked
in primary jobs*

$$\text{Hours worked for self – employed in primary jobs} \\ = \text{Average number of paid hours in primary jobs of employees (BfL)} \\ \cdot \text{Factor for conversion from paid hours to hours worked (LON)} \\ \cdot \text{Factor more hours worked by self – employed comp. to employees (LFS)} \\ \cdot \text{Monthly distribution factor (BfL and LFS)} \\ \cdot \text{Leap year effekt} \\ \cdot \text{Easter effect}$$

*Hours worked in sideline
jobs*

$$\text{Hours worked for self – employed in primary jobs} \\ = \text{Average number of paid hours in primary jobs of employees (BfL)} \\ \cdot \text{Factor for conversion from paid hours to hours worked (LON)} \\ \cdot \text{Factor more hours worked by self – employed comp. to employees (LFS)} \\ \cdot \text{Monthly distribution factor (BfL and LFS)} \\ \cdot \text{Leap year effekt} \\ \cdot \text{Easter effect} \\ \cdot \text{Sideline job factor (BfL)}$$

Sideline jobs is defined as all non-primary jobs (ie jobs also beyond the person's largest secondary job).

Firstly, we do not want to restrict ourselves to full-time jobs for employees, as it is not expedient to apply a hourly threshold, as the calculations are affected by the bias that self-employed and assisting spouses overstate, to a great extent, than employees in the Labour Force Survey.

Secondly, the LFS is conducted as a sample survey subject to statistical uncertainty, especially with regard to small groups. Consequently, we have combined the group of self-employed and assisting spouses in the calculation of average hours per job.

We also do not want to base ourselves on the information side job in the LFS because the LFS collect only information on the primary and secondary jobs but not other jobs the persons may have.

Instead, a sideline jobs factor based on BFL is used. The "sideline job factor", i.e. the relationship between paid hours in sideline jobs and paid hours in primary jobs ranges according to Employment Statistics for Employees (BfL) around 0.30 of the hours in the main job and not 0.5 as previously assumed. It is assumed that the relationship between hours worked and paid hours is similar in the primary jobs and sideline jobs. It is not possible for us to distribute the data from the statistics on earnings (which we apply in conversion from paid hours to hours worked) in primary and sideline jobs.

4. Compensation of employees

Conceptually, compensation of employees in the WTA have been changed, implying that compensation of employees are now identical with the payroll costs published in the Establishment-related Employment Statistics, see [Concepts in the Danish Working Time Accounts](#). Before the revision the wage sum in the WTA were more closely related to the wage sum in the national accounts (see section 5).

The difference between the compensation of employees published in the WTA and the ERE statistics is that wages and salaries in the ERE statistics operates with an activity threshold applies to economic statistics, a limit which is not used in labor statistics (or economic statistics).

Generally the WTA wage sum includes the components of remuneration available at the job level, while national accounts compensation of employees also includes adjustments to the wage sum at a more aggregate level. For a description of the transition from WTA's compensation of employees to the national accounts compensation of employees see the national accounts publications.

For the use of the business short-term regulation (STS) a special wage concept is calculated exclusive of pensions and benefits. This wage concept is identical to the concept of '*narrow wage sum*' in eIncome that includes wage earners A income.

5. Changed division of labor between the WTA and the national accounts

In connection with the revision by the end of 2012 of the WTA, the work sharing between the National Accounts and the WTA has been changed, implying that the WTA make adjustments to those matters that can be adjusted at level of jobs, while the National Accounts conduct further adjustments at a more aggregated level. This change in the work sharing gives rise to greater difference between the concepts used in the WTA and those used in the National Accounts. In contrast, the work sharing of adjustments implies that adjustments are conducted, to the greatest possible extent, where the expertise is centred. Finally, the change in the work sharing has also resulted in fewer revisions in the WTA, which is, subsequently, no longer dependent on final data in the National Accounts.

Abbreviations used

BfL: Employment Statistics for Employees (in Danish: Beskæftigelse for Lønmodtagere).

ERE statistics: the Establishment-related Employment Statistics (sometimes called Employment in Businesses (EiB) (in Danish: [Erhvervsbeskæftigelsen](#)).

LFS: Labour Force Survey (in Danish: Arbejdskraftundersøgelsen).

LON: The Structural Earnings Statistics (in Danish: Lønstruktur statistikken)

RAS: The Register-based labour force statistics (in Danish: Den register-baserede arbejdsstyrke statistik).