STATISTICS DENMARK

Documentation of statistics for
The Annual and Quarterly Working Time Accounts 2016
Quarter 2

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STATISTICS DENMARK

1 Introduction

The Danish Working Time Accounts (WTA) is an integrated statistics with consistent time series on employment, number of jobs, hours worked and compensation of employees in both annual and quarterly basis. The current time series goes back to 2008 (quarterly statistics as from the 1st quarter of 2008).

2 Statistical presentation

The Working Time Accounts produce integrated statistics with consistent time series on employment, jobs, number of hours worked and compensation of employees on an annual and quarterly basis. The data basis is made up by a number of primary statistical data, which are adapted and adjusted to achieve agreement of the concepts and definitions used in the WTA system.

The statistical sources used in the WTA are Labour Market Accounts (LMA), Structural Earning Statistics (SES), A-Income Statistics (AINCOME) and Employment Statistics for Employees (BfL).

The current statistics include data broken down by sex, industry, sectors and socioeconomic status (self-employed, assisting spouses or employees).

STATISTICS DENMARK

2.1 Data description

The primary purpose of the WTA is to compile time series on hours worked. In addition, an object is to calculate the wage and employment data for national accounts.

The WTA is an integrated statistic with consistent time series on employment, jobs, hours worked and wages in both annual and quarterly basis. The data base consists of a number of statistics which are adapted and adjusted to the framework provided by the WTA system.

The system for the Working Time Accounts is the result of a three-year project established in Statistics Denmark in 1995 with grants by The European Social Fund. The purpose of the project was to improve the current statistical description of the Danish labour market. The background to the WTA is that there has been a considerable expansion in the number of statistics covering the labour market and the fact that the figures from different statistics are not immediately comparable. The project work has been concentrated on developing statistical systems integrating already existing labour market statistics. In December 1998 the project ended with the publication of a report: "Integrated Labour Market Statistics - the Labour Market Accounts and the Working Time Accounts 1995-97" ("Integreret arbejdsmarkedsstatistik - Arbejdsmarkedsregnskab og Arbejdstidsregnskab 1995-97") in which two new statistical systems were presented. In 1999 the WTA were presented by Statistics Denmark with the inclusion of annual as well as quarterly statistics.

In December 2012 the Working Time Accounts were adjusted, implying that new data sources (primarily based on eIncome) are used for the compilation. Subsequently, the WTA were compiled on the basis of a new system. As changes have been made to the population, concepts, sources as well as methods, this has resulted in revised levels and revised developments throughout the year.

As from the publication in September 2016 of the WTA for the second quarter of 2016 and the annual WTA for 2008-2015 the working time accounts system surpasses to use data from the new Labour Market Accounts (LMA). This has given rise to minor revisions in the levels of employment, jobs, hours worked and compensation of employees.

The Working Time Account transmit quarterly data to the short term business statistics (STS). The variables transmitted to STS_Eurostat are: - Number of Persons Employed (Variable 210) - Hours Worked (Variable 220): Paid hours worked in the jobs. - Gross Wages and Salaries (Variable 230): Earned DKK earned as compensation for hours worked or for hours paid but not worked.

2.2 Classification system

Industry:

Industry classification is linked to the workplace and specific workplace's main activity, according to Statistics Denmark Danish Industrial Classification (Dansk Branchekode). Danish Industrial Classification is a 6-digit nomenclature based on the EU industrial classification, NACE, which constitutes the first 4 digits of the Danish Industrial Classification. The WTA published aggregated industry reports, where the activities on detailed industry codes are aggregated to Statistics Denmark's standard classifications.

Also, the WTA is broken down according to national account industry groupings.

Sector:

Sector uses national account sectors (ESA 2010 sectors) to make a 2 group sector breakdown in the WTA: *general government* versus *Corporations and organizations*.

- *General government* includes central government, regional government, municipal government, and social security funds.
- *Corporations and organizations* includes private corporations, public corporations, private nonprofit organizations and sector not stated.

A detailed description of the transformation to ESA 2010 sectors is given in the paper *Ny sektorkode i beskæftigelsesstatistikkerne* (New sector code in the employment statistics).

Socioeconomic Status:

Socioeconomic status is in WTA a breakdown on employee, self-employed or assisting spouse (i.e. 3 groups).

Full time:

In the annual Working Time Accounts a few tables are broken down according to work on full-time and part-time in the series Statistical News ("Statistiske Efterretninger"). In the present context, full-time work is defined as at least 32 paid hours of work in the job per week for employment over the entire week, or at least 139 paid hours of work in the job for employment over the entire month.

STATISTICS DENMARK

2.3 Sector coverage

WTA covers all the ESA 2010 sectors Danish registered companies can be assigned (i.e. all sectors excluding rest of the world and foreign-controlled entities).

However, WTA sectors aggregated to a division into 2 groups, respectively *Corporations and organizations* and *General government*.

General government include central government, regional government, municipal government, and social security funds.

Corporations and organizations includes private corporations, public corporations, private nonprofit organizations and sector not stated.

See sectors for more detailed information on ESA2010 sectors.

Regarding data transmitted to the Eurostat short term business statistics (STS), only data in sector group *Corporations and organizations* are transmitted, and the indicators are broken down according to Annexes according to NACE rev. 2.0 local kind of activity unit according to the Danish business register:

- A: Industry (IND), covering Sections B to E (B, C, D, E, B_TO_E36, B06, B08, B09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, D35, E36, MIG_ING, MIG_CAG, MIG_DCOG, MIG_NDCOG, MIG_NRG)
- B: Construction (CONS), covering Section F
- C: Retail Trade and Repair (RTD), covering Division 47, except Group 47.3 (G45, G46, G47, G47_X_G473)
- D: Other services (SERV), covering most of Sections H to N (H, H49, H50, H51, H52, H53, I, J, J58, J59, J60, J61, J62, J63, L, M_STS, N_STS)

No cut-off on the basis of the number of employees is used. All size classes are included (no breakdown on size classes).

2.4 Statistical concepts and definitions

Employment: Employment is an assessment of how many people (headcount) employed at any given time. Employed is, if one has an attachment to a workplace in the form of a job where you at least have one hour of paid work in the reference week. Persons who up to a period of 45 days have not received salary, but subsequently returned to the same employer, are included in the period without pay. See detailed description of concepts.

Job: Jobs shows the number of jobs that are active (excluding temporary absences in the form of eg. maternity or other leave) at any given time. The labour market statistics are a job actively, if there is a minimum of 1 paid hour per week. A job is defined as a person connected to a workplace. The same person can have several jobs at the same time. Persons who up to a period of 45 days have not received salary, but subsequently returned to the same employer, are included in the period without pay. See detailed description of concepts.

Wage: Compensation of employees in the WTA includes compensation of employees in cash or in kind which the employer pays to an employee for work performed in an accounting period. See detailed description of concepts.

Hours Worked: Hours worked are defined as hours paid by employers, including paid overtime and excluding paid hours of absence. Unpaid overtime hours and criminal (incl. black) work are excluded from the calculation of hours worked in the WTA. See detailed description of concepts.

2.5 Statistical unit

The statistical units in the WTA are: - Paid hours worked. - Earned DKK. - Number of persons. - The number of jobs.

An employed person can have one or more jobs. A job is defined as a person connected to a workplace. In each job the person performs a number of hours worked and receives as compensation a salary measured in DKK. 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 regards the number of hours worked in relation to temporary absence.

The working time account is not calculated at the level of individual jobs. Data in WTA is aggregated, where the number of hours worked, compensation of employees, the average number of jobs and the average employment summed to industry level (6 digit DB), sector, socioeconomic status (3 groups), sex (2 groups), and scope of work (5 groups). From this level data is summarized for publication level (including various types of industrial aggregates).

2.6 Statistical population

Employed employees, self-employed and assisting spouses of Danish registered enterprises.

The population covers persons working in Danish enterprises or on Danish ships. The population of the WTA are persons affiliated to Danish registered companies, which is consistent with ESA2010 boundaries. ESA2010 includes working in resident companies (see ESA 2010 paragraphs 2.04 to 2.11).

The WTA do not include employees of foreign business enterprises hired out for work in Denmark according to the rules governing hiring-out of labour.

Regarding data transmitted to the Eurostat short term business statistics (STS), only data in sector group *Corporations and organizations* are transmitted, and the indicators are broken down according to Annexes as defined in section *Sector coverage*.

2.7 Reference area

Denmark.

2.8 Time coverage

Q1 2008 - (for all indicators in all breakdowns).

2.9 Base period

Not applicable to this statistic. Only absolute values are published.

2.10 Unit of measure

Data are published in absolute values:

- Employment is calculated as the number of persons.
- Job is calculated as the number of jobs.
- Hours worked is calculated as the number of hours. In STATBANK these are calculated in 1000 hours.
- Compensation of employees is measured in DKK. In STATBANK compensation of employees measured in millions DKK.

Data are published as:

- absolute values
- seasonally adjusted values
- working day adjusted (hours worked and compensation of employees).

2.11 Reference period

01-01-2008 - 30-06-2016

2.12 Frequency of dissemination

Annual and quarterly statistics are published. WTA will in the future publish two annual publications (in September with preliminary data for the last year, and in February with final data). Quarterly data is published four times a year.

2.13 Legal acts and other agreements

Not relevant for the Working Time Account as they are compiled exclusively on existing statistics.

WTA provides labour market data to EUROSTAT business short-term regulation (STS) and the national accounts (ESA / ESA).

STS: Council Regulation (EC) concerning short-term statistics:

- Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics, 1165/98, OJ L 165, p.1, 05-06-1998.
- European Parliament and Council Regulation (EC) No 1158/2005 of 6 July 2005 amending Council Regulation (EC) No 1165 / 98 concerning short time statistics. 1158/2005, OJ L 191, p.1, 22-07-2005.
- Commission Regulation (EC) No 586/2001 of 26 March 2001 implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards the definition of Main Industrial Groupings. 586/2001, OJ L 86, p 11, 27-03-2001.
- Commission Regulation (EC) No 1503/2006 of 28 September 2006 implementing and amending Council Regulation (EC) No 1165/98 concerning short-term statistics as regards definitions of variables, list of variables and frequency of data compilation. 1503/2006, OJ L 281, p 15, 12-10-2006.
- Commission Regulation (EC) No 656/2007 of 14 June 2007 amending Regulation (EC) No 586/2001 implementing Council Regulation (EC) No 1165/98 concerning short-term statistics as regards the definition of industry groups. 656/2007, OJ L 155, p 3, 15/06/2007.
- COMMISSION REGULATION (EC) No 1178/2008 of 28 November 2008 amending Council Regulation (EC) No 1165/98 concerning short-term statistics and Regulation (EC) No 1503/2006 and (EC) No 657/2007 as regards adaptations following the revision of statistical classifications NACE and CPA. 1178/2008, OJ L 319, p 16, 29-11-2008.

ESA / ESA: Council Regulation (EC) on the European system of national accounts:

- Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the European Community. 2223/96 OJ L 310, p.1, 30-11-1996.
- European Parliament and Council Regulation (EC) No 1392/2007 of 13 November 2007 amending Council Regulation (EC) No 2223 / 96 with respect to the transmission of national accounts data. 1392/2007, OJ L 324, p.1, 10-12-2007.
- Commission Regulation (EU) No 715/2010 of 10 August 2010 amending Council Regulation (EC) No 2223/96 as regards changes in the national accounts as a result of the revision of the statistical classification of economic activities NACE rev. 2 and the statistical products by activity (CPA). 715/2010, OJ 210, p.1, 11/08/2010.

2.14 Cost and burden

No response burden. New systems for reporting data have not been established. All data requirements are fulfilled by existing statistics.

2.15 Comment

Concepts in the Danish Working Time Accounts.

Break in WTA on transition to eIncome.

Break in WTA due to changed classifications since 2008.

Differences in concepts and statistics on employment and number of hours worked are described in the following paper begrebsforskelle.

Additional documentation of differences between the employment statistics can be found at employment.

Documentation relating exclusively to the working time accounts can be found at [the Working Time Accounts]http://www.dst.dk/en/Statistik/emner/beskaeftigelse/arbejdstidsregnskab.aspx?tab=dok).

3 Statistical processing

The population and concepts as well as levels of the variables are defined by annual structural data sources. Short-term data sources are applied in projections to periods for which structural data are not available. Summation of the data in the Working Time Account is conducted before they are projected. Data in the Working Time Account are seasonally adjusted both for use in Denmark as well as for use in Eurostat's business short term statistics (STS).

3.1 Source data

The WTA are based on a combination of census and survey data. The WTA are compiled on the basis of four primary data sources:

1. Labour Market Accounts see Documentations of statistics LMA
2. Structure of Earnings see Documentations of statistics SES
3. A-Income Statistics see Documentations of statistics AINCOME
4. Employment Statistics for Employees see Documentations of statistics BfL.

(1) With AMR monthly statements are available on employment, jobs, temporary absences and paid hours of work and for employees also compensation of employees throughout the calendar year for all the years covered by AMR data.

AMR form the basis of ATR on paid hours of work for self-employed and assisting spouses. In AMR these are calculated on the basis of hours paid for employees, but enumerated with how much more self-employed and assisting spouses are working according to labor force survey (LFS). Furthermore, ATR uses the latest developments in AMR to project jobs, employment and paid hours of work for self-employed and assisting spouses.

With AMR longitudinal data, it has become significantly easier to establish, whether leave has its origin in employment or unemployment. WTA uses information on leave from LMA covering all months of the year. Furthermore, continuing recent trends from AMR WTA projects information on leave from employment (sickness and maternity) to months where no structural data exist.

Another huge quality improvement is that LMA can produce preliminary structural data for the reference year 2015 to be available already in August 2016.

(1) Structural Earning Statistics are used to convert paid hours of work from AMR to actual hours worked during the year in WTA.

Furthermore, data from the structural earning statistics are used as help information to describe the distribution of hours worked over the months of the year in the WTA. Earning statistics are used for identifying jobs for workers paid by the hour, who are characterized by not being paid during absence. Therefore, the distribution of paid hours of work by hourly workers can represent the distribution of actual hours worked over the months of the year.

Furthermore, studies based on the labor force survey (LFS) shows that self-employed and assisting spouses do not have a significantly different distribution of hours worked over the year than employees. This information is in the WTA used for calculating the relative distribution of hours worked compared to hours paid for over the months of the year for all employed.

So although from eIncome (AMR and employment statistics for employees) only information on paid hours of work in the month are available, the ATR can thereby calculated how much this represents in hours worked per. month, based on the knowledge of how actual hours of work are distributed relative to paid hours of work over the months. Paid hours of work generally have a different distribution over the months of the year than actual hours worked due to the fact that absence is not evenly spread over the months of the year.

(3) Income statistics data based on reports from the Danish Central Pension System (CPS) are used for adjusting compensation of employees in the WTA to include earnings of fonded labour market pension.

(4) The Employment Statistics of Employees (BFL) contains monthly data on jobs, hours paid and compensation of employees throughout the year for employees. The information is used in the WTA to project compensation of employees, hours paid for, employment, primary and sideline job for employees during periods when there is no AMR data. Given that LMA include preliminary structural data, then the projection period is reduced so that the maximum length of projection is 15 months. The 15-month projection occurs in the calculation of the first quarter in June, while for example the calculation of Q2. figures in September will only be projected for six months. This increases the quality of the WTA statistics considerably.

In deciding which data sources to apply in compiling the WTA, attention is centred on the major advantages provided by each individual statistics. For example, LMA are used to ensure complete coverage in the calculation of employment, number of jobs, aggregate payroll costs and paid hours of work. This includes personal interviews used for obtaining information on groups that are not covered by the registers. Information from the wage and salary system of the business enterprises is used to convert paid hours of work into hours worked during the year.

The Working Time Accounts are exclusively based on existing data sources, which are subsequently converted to the concepts used in the WTA. The WTA is flexible in its choice of primary sources, which can be replaced by other sources, if these have proved to be more accurate. The choice of primary source decides the amount of data editing necessary. When it comes to integrating all the sources, however, all the concepts are consistent in conforming to international standards and every variable fulfils the requirement of the system for the WTA.

Data in ATR are summarized (aggregated) prior to integration and projected so that the output data alone are broken down by socio-economic status (whether you are an employee, self-employed or assisting spouse), industries, sectors, gender and amount of work.

STATISTICS DENMARK

3.2 Frequency of data collection

Is not relevant to this statistic as the WTA only make use of already existing statistics (i.e. no new reports).

3.3 Data collection

Is not relevant to this statistic as the WTA only make use of already existing statistics (i.e. no new reports).

STATISTICS DENMARK

3.4 Data validation

Data are already checked for errors in the primary statistics. In the WTA further checks, troubleshooting and debugging are carried out. This is partly based on the information from the producers of the input sources, partly systematic (mostly figurative) controls the internal consistency between variables and over time, and by comparisons with other published statistics. Finally developments are systematically being discussed with stakeholders from other statistics, including in the context of short term statistics interest groups (where data is typically assessed on the level of News from Statistics Denmark, which for the quarterly statistics will say aggregated to 10 industrial groups and 2 sector groups). When developments look strange, then the reason behind this is being analysed, with possible assistance from producers of input statistics, and if errors are detected then corrections are included in the system. In some cases, the statements lead to corrections in the primary statistics.

Each series are examined quarterly by evaluating the series over time (monthly from 2008 onwards) level:

- employees: 127-industrial grouping * 2 sector groups
- self-employed and assisting spouses: 19 industrial groupings

In connection with the annual estimates error detection is carried out also by gender and full time / part time and more detailed breakdown for self-employed and assisting spouses..

Calculations to illustrate the internal consistency in the WTA (assessed accordingly over time at the above level):

- Hours worked per employee
- Hours worked per employed
- Hourly wage (compensation of employees / hours worked for employees)
- Wage per employee (compensation of employees / number of employed workers)

Comparisons with published statistics:

- National Accounts (employment, hours and compensation of employees)
- Employment of Employees (full-time jobs and compensation of employees)
- Public employment statistics
- Indices of average (hourly) earnings in the private and public sector
- Labour Force Surveys (employment and development in hours worked)
- Number of persons employed in the construction industry

It is possible in the system for the Working Time Account to enter corrections in the input data sources as well as in the output data sources of the Working Time Account before they are disseminated. It is also possible to make feedback to those responsible for the input data sources.

3.5 Data compilation

The starting point for the calculation of the average employment and the average number of jobs is status information on persons employed and the number of jobs each day of the month, according to AMR. When the average number of employees, respectively the average number of jobs, in the quarter (year) is calculated, this is done as an average of the 3 months of the quarter (12 months of the year). Actual hours worked and compensation of employees in the quarter (year) is calculated as the sum of hours worked and compensation of employees in the three months of the quarter (12 months of the year).

WTA is a statistic that is based on the integration of several input data sources / existing statistics. In the WTA a lot of development is continuously taken place in the form of revisions due to new data input sources, data breaks in existing input sources, revisions in line of industry codes, new sector codes, new or changing needs of users (national and international), need for projecting data back in time to periods of the current system does not cover, etc.

For more comprehensive changes may be needed for explanatory analyses and preparation of memoranda for internal use, to Eurostat or to the website. This will typically happen in the incorporation of new annual structural data, and major revisions (where data is typically revised throughout the time series length). If the elucidations results in recommendations to revise (all or part of) the WTA begins a new project.

The detailed working processes in the operational running of the WTA are described in the work process documentation of the working time accounts (WTA). In this specification, the above operations are not described.

3.6 Adjustment

No corrections of the data are carried out beyond what has already been described during data validation, data processing and seasonal adjustment.

4 Relevance

The statistics is relevant for users interested in social and economic statistics.

4.1 User Needs

Among users are politicians, ministries, interest groups, businessmen, researchers, major private companies and others interested in the development of the Danish labour market. The areas of application are mainly the National Accounts, economic models, economic government departments and labour market organizations.

When major revisions are released, the changes are described in Documentation of statistics and in potential more comprehensive notes available at the website. In addition users are oriented about the background for the changes, when the changes are put into force, and the reference period the changes are related to, as early as possible in the process via user committees (user committee for labour market statistics and user committee for economic statistics), in the forum of short term statistics and on interest group meetings. In addition, revisions of the Working Time Accounts are discussed and coordinated with the national accounts.

4.2 User Satisfaction

Users interested in the social and economic statistics have expressed satisfaction with the quality of the statistics. However, they also expressed frustration over large data breaches, especially in the transition to e-Income-based sources.

User Committee for Labour Market Statistics includes the areas employment, unemployment, wage subsidies jobs, earning statistics and statistics on absence. The user committee hold meetings once or twice a year to ensure running contact and dialog on the scope of statistics, developments, quality and communication. The members of the committees are important users of the products of Statistics Denmark within the subject areas of the user committee.

The User Committee for Economic Statistics covers the topics national accounts, public finances, short term statistics, external economy, globalization, employment, prices, consumption and financial statistics. The committee normally holds meetings in June and December. At these meetings the revisions of the Working Time Accounts have generally been embraced, as no users have doubted that the quality of the WTA has been improved significantly. However, data fractures been difficult for users to handle. Especially for the national accounts and its users and for the Productivity Commission has the restructuring to using the eIncome statistics - especially with the very significant drop in the levels of hours worked - has given rise to much frustration and additional work load.

4.3 Data completeness rate

Up to the revision of the WTA in September 2016 the delimitation of data supplies from the Working Time Account to the short-term business statistics (STS) were the sector group “business enterprises and organizations, i.e. exclusive of “general government sector”. In other words, the population in the short-term business statistics were greater than the market share of the economy, which is covered by the Regulation, as sector code 89: Non-profit institutions serving households (NPISH) were not excluded from the data deliveries from the Working Time Account.

With the revised WTA in September 2016, this reservation is no longer necessary, since data to the STS now (with data revised back to 2008) cover the market sector of the economy only, as recommended by the regulation. This has been possible because data in the revised WTA system is available in more detailed sectoral codes.

5 Accuracy and reliability

The WTA has been revised to use longitudinal data from the labor market accounts (LMA) as data input. WTA thus builds on structural data covering all months of the year. Further, the period of projection using short term statistics has been significantly reduced, since the working time accounts make use of a preliminary version of LMA for the year 2015 and the structure on earning statistics for 2015 has been included as well. There is therefore a significant improvement in quality of the WTA.

5.1 Overall accuracy

There have been no measurements of the magnitude of revisions, etc.

Since data includes provisional LMA structural data, the projection period has been reduced so that the maximum length of projection is 15 months. The 15-month projection occurs in the calculation of Q1 in June, while for example the calculation of Q2 in September only will be projected for six months. This increases the quality of the statistics considerably.

In general, the quality of data has improved significantly with the use of the new eIncome source and has become even better with the transition to use LMA data.

Previously, the WTA was calculated by combining a lot of different sources. After the reorganization in 2012 the WTA is based primarily on eIncome sources. This is the same basic data for most of the sources included in the WTA, which ensures a high degree of internal consistency.

In the transition to AMR precision was changed once again, because in AMR integrated and harmonized in a very wide range of data sources in one statistic system. This means that LMA may highlight labor significantly better than the current individual statistics can be, especially compared to the timing of the transition from one labour market state to another. At the same timer, LMA is a census of the population, and thus there is not the same uncertainty as statistically based sampling. Read more on precision in LMA.

In relation to the boundaries of jobs for self-employed and assisting spouses problem lies primarily in ensuring that there is enough activity to define a job. The problem here is that there is no comprehensive data on volume measures for self-employed and assisting spouses. To calculate payroll for self-employed and assisting spouses is not possible (since there is no direct link between the vesting period and payment period and the wage concept at all for this group is very difficult to define). The only statistic that provides information on working volume for these groups is the labor force survey (LFS), which is a sample survey where you ask the employed themselves about how many hours they have worked during the reference week. We suspect that there is a tendency, when you ask the employed themselves, that they overstate the number of hours worked. This is especially true for self-employed and assisting spouses. Although the calculation of hours worked is based on register-based information on working hours for employees, we cannot correct for the excess reporting for self-employed and assisting spouses compared to reports by employees in LFS. This means that hours worked for this group in the WTA is probably overvalued, although we do not have targets on how much.

Since the projection of maternity leave and sick leave for all employed as well as job and employment for self-employed and assisting spouses is based on the latest developments in AMR, the development of the (relatively short) period after the latest AMR data is more uncertain since the projection will not catch any real sudden occurring changes. This method was chosen because there is no better data sources available.

The conversion from paid hours of work to hours actually worked are carried out at a more aggregated level of ATR using the structural statistics on earnings broken down on reference year, gender, 6 sectoral groups, 8 industry groups and a breakdown of whether you are a manager, middle manager or not a leader in the job. The information is deemed to fit on a general level in relation to these divisions, but the information on more detailed level should be interpreted with caution.

Not only has there been a significant quality improvement related to the transition to eIncome. Over time, the eIncome register have also been improved. Thus, a quality measure for the calculation of hours worked is the proportion of hours paid in eIncome that have been imputed because they have either not been reported or because they have proved to be invalid:

Year Total Corporations and organizations General government 2008 14.6 percent 17.7 percent 7.8 percent 2009 11.6 percent 13.5 percent 7.7 percent 2010 10.6 percent 11.9 percent 8.1 percent 2011 8.3 percent 9.6 percent 5.7 percent 2012 5.8 percent 7.1 percent 3.1 percent 2013 4.2 percent 4.8 percent 2.9 percent 2014 3.6 percent 3.7 percent 3.2 percent 2015 3.3 percent 3.6 percent 2.9 percent

In general, there is a tendency that more and more report information on hours paid to eIncome, which guarantees a better quality over time. Furthermore, the guidelines from the tax authorities on the reporting of hours paid to eIncome have become more clear, and the precision and knowledge of

concepts are increased in the reporting over time so that, for example, the reporters become aware that unpaid absences are not to be included in the reported hours paid.

5.2 Sampling error

Not applicable to this statistic.

5.3 Non-sampling error

Some reports to eIncome for employees lack information on hours paid or the reported information has been found to be invalid. Therefore, imputed (estimated) paid hours of work for these reports.

5.4 Quality management

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

5.5 Quality assurance

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

STATISTICS DENMARK

5.6 Quality assessment

The margins of statistical uncertainty associated with the Working Time Accounts are related to the statistical uncertainty of the individual primary statistical data that are used. The source used absolutely fundamental to describe the level and developments in the WTA, is the LMA. The conceptual consistency and the uniform adaptation of sources over time contribute to a reduction of the margins of statistical uncertainty in the Working Time Accounts. Especially, the juxtaposition of information from the primary sources in a joint system of the Working Time Accounts implies that the results will automatically be compared and thereby reveal any errors and inherent problems of consistency in the basic concepts and data. These errors and inconsistencies are reported back to the primary sources. The work on integrating statistical systems will thus be instrumental in enhancing the general data quality of the primary statistical data.

For a description of the statistical uncertainty of the primary sources, see the respective Documentation of statistics:

1. Labour Market Accounts see Documentations of statistics LMA
2. Structure of Earnings see Documentations of statistics SES
3. A-Income Statistics see Documentations of statistics AINCOME
4. Employment Statistics for Employees see Documentations of statistics BfL.

Self-employed and assisting spouses make up the group for whom the lowest quality of data is available on number of jobs (with activity over 1 weekly working hour), length of job (duration of each individual job) and number of hours worked in each individual job in the data sources. The consequence is that the information on employment, jobs and hours for self-employed and assisting spouses in the WTA are subject to a relatively greater degree of uncertainty than it is for employees.

When the LFS is applied in the LMA in adjusting how many more hours are worked by self-employed and assisting spouses compared to hours worked by employees, it is impossible for us to take into account that there is a tendency for self-employed to overstate, to a greater extent, than is the case for employees. It would be extremely subjective, if we were to introduce a factor for the extent of this overstatement made by the self-employed compared to the employees. However, we have an assumption that this overstatement is greatest in cases where the workplace for the self-employed (and the assisting spouse) is the residence of the self-employed, as it must be assumed that the relation between working time and leisure time becomes more blurred. This applies, especially, to employment in agriculture, etc. and small businesses in retailing and hotels and restaurants.

In eIncome information is reported with regard to paid hours in the jobs in the individual reference month. This information is the primary source on paid hours of work in the LMA. The quality of this information naturally reflects the quality of the the data reports. Generally, we think that the information has a high quality. However, particularly related to the data on unpaid hours of absence and overtime hours there may be quality problems in the primary data of the eIncome register. Some problems have been revealed with respect to data reports of paid hours for employees paid by the month who are not paid for in periods of absence. Lack of impairment of hours paid for as a result of unpaid absence leads to an overestimation of paid hours. Lack of registration of paid overtime will result in an underestimation of hours paid. Typically, the registration problem worse related to hours of unpaid absence. There can be, especially for salaried who have not paid absences be a problem in that the hours are not always written down sufficiently during periods of absence.

5.7 Data revision - policy

Statistics Denmark revises published figures in accordance with the Revision Policy for Statistics Denmark. The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

5.8 Data revision practice

The Quarterly Working Time Accounts will be currently published in accordance with Statistics Denmark's specialized goals of timeliness, which with respect to the quarterly statistics implies not later than by the end of the subsequent quarter.

Data on employment for employees is available from both the provisional version as well as from a final version, and consequently the two most recent quarters will be subject to revision in conjunction with the compilation of each quarterly statistic.

When new structural data are incorporated (LMA and structural statistics on earnings) in connection with the compilation of the Annual Working Time Accounts, the levels as from this year will be revised, i.e. also during the entire period of projection. When final structural data are incorporated, the data in the Working Time Accounts are considered to be final.

However, data in the Working Time Accounts can be subject to revision as a result of updated values in the primary sources, in the case of methodological changes or use of new information and sources.

6 Timeliness and punctuality

The publication time for the annual statistics, the reference year + 6 months. The publication time for the quarterly statistics is that quarter plus two months and 15 days.

The time series covers the period Q1 2008 - Q2 2016 quarterly WTA, published September 15, 2016 and the period 2008-2015 * in the annual WTA publication September 20, 2016.

6.1 Timeliness and time lag - final results

The WTA is published twice a year as from September 2016 (with provisional figures for the last year in September, and again in February when the provisional yearly data are replaced with final data from LMA), and four times a year with quarterly.

WTA will continuously be published in accordance with Statistics Denmark benchmark goals. For quarterly statistics concerned, this means published data by the end of the following quarter. On account of requirements from business short-term regulation (STS), provisional data from the WTA are transferred to EUROSTAT + 2 months and 15 days. For the annual statistics the guiding target is by the end of the following year.

The statistics are usually published without delay in relation to the scheduled date.

STATISTICS DENMARK

6.2 Punctuality

For WTA quarterly publication since the transition to eIncome basis December 2012 was 93.8 percent (15 out of 16 publications) published exactly as planned or ahead of schedule. One issue that did not comply with the pre-announced deadline was the publication of Q3 2013, when data founded was not good enough and therefore the release was three days late.

The annual ATR has since December 2012 been released three times, all at pre-announced time (100 percent.).

Data to Eurostat (STS) are evaluated based on requirements for interim STS quarterly (within 2 months after the reference quarter) and here meets 81.3 percent the requirements (13 out of 16 deliveries since WTA revised to eIncome basis in December 2012).

For the final STS quarterly data 87.5 per cent (7 out of 8 of the releases) were transmitted according to the required deadline (within 2.5 months after the reference quarter).

7 Comparability

WTA deliver labour market data to Eurostats corporate short-term regulation (STS) and the national accounts (ESA / ESA). Therefore, changes in these regulations typically result in changes in the WTA. A description of the transitional tables between the WTA and the National Accounts can be found in the publications on the National Accounts. Transitional tables between the WTA and the Register-based Labour Force Statistics and the Establishment-related Employment Statistics are published in Statistical News ("Statistiske Efterretninger") for the annual WTA.

STATISTICS DENMARK

7.1 Comparability - geographical

The Danish Working Time Accounts are worked out according to international guidelines, European System of Accounts (ESA 2010) and International Labour Organisation (1988: Current International Recommendations on Labour Statistics), the latest of which is reviewed in 2013 (Resolution concerning statistics of work, employment and labour underutilization, 19th International Conference of Labour Statisticians).

The population of the WTA are persons affiliated to Danish registered companies, which is consistent with ESA2010 boundaries. ESA2010 includes working in resident companies (see ESA 2010 paragraphs 2.04 to 2.11) (colloquially called 'the daytime population'). ILO / ICLS guidelines include the resident population (colloquially called 'the nighttime population').

Since the WTA is primarily a register-based statistics it does not include information about unpaid overtime, undeclared work and criminal work.

We work in Statistics Denmark on exploiting information from Register of foreign services in Denmark (Register over Udenlandske Tjenesteydelser i Danmark, RUT) to create a better illumination of border work. RUT included hiring out labour, corporate transferees and sole proprietorships that provide services in Denmark, but not taxable in Denmark. RUT-employment is not a part of the nighttime population (typically used for population delineation of social statistics, including labour market statistics), since workers do not reside in Denmark. The national accounts is about to disentangle, whether RUT employment relationships should be included in national accounts employment (in terms of the activities are conducted in Denmark and thus should be included in the daytime population) or whether they should be categorized as "import of foreign services" (as they are engaged are employed by - and receives salary, from - the foreign company). The part of the RUT employment to be included in the national accounts daytime population, will also be included also in the Working Time Accounts employment.

7.2 Comparability over time

The compilation of Working Time Accounts is based on the idea that the figures are comparable over time to the highest possible degree. The sources will continuously be improved and replaced by other sources if these have proved to be more accurate. New sources will always be adapted to the concepts of the Working Time Accounts System. This implies that adjustments of existing sources cannot immediately be seen as changes of variables and concepts in the Working Time Accounts Statistics, although adjustments of the level of the specific variable may be made according to the new and improved information.

Basically there was a major break in the Working Time Accounts end of 2012 in connection with the transition to e-Income-based sources with data as from 2008, see se Break in WTA on transition to eIncome.

Furthermore, there were breaks in the WTA as a result of revisions to the classifications of sectors and industries, see [Break in WTA due to changed classifications since 2008] http://www.dst.dk/ext/arbe/WTAbreak).

In addition there are some minor revisions described below.

Upon publication of Q4 2014, a minor error has been corrected which to a limited extent has affected the figures in Q2 and Q3 2014. The revision is of the order of 0.2 per cent on employment, hours worked and wages in the sector group *corporations and organizations*. Within the sector group *general government* the revision is much less.

Upon publication of Q2 2013 minor changes back in time have been incorporated, especially within the sector group *general government*. The changes are due, inter alia, to updated sectors and industries in the business register incorporated in the employment statistics for employees in the entire time series from Q1 2008 to Q2 2013, not least with regard to:

- Family care (DB07 = 879020)
- Hospital activities (DB07 = 861000).
- General public administration activities (DB07 = 841100, 841200)

On publication of WTA Q1 2013 and the annual WTA June 2013 the data from the statistics of employees was based on a preliminary version of Q4 2012. These were revised at the end of July 2013.

7.3 Coherence - cross domain

A fundamental principle of the Working Time Accounts is to document the coherence between statistics utilized in the Working Time Accounts and to document coherence between the primary statistical data and the Working Time Accounts.

The Danish Working Time Accounts are worked out according to international guidelines.

Transitional tables between the WTA and the Register-based Labour Force Statistics (employment) and the Establishment-related Employment Statistics (jobs and compensation of employees) is published in Statistical News ("Statistiske Efterretninger") for the annual WTA. A description of the transitional tables between the WTA and the National Accounts (employment, hours and compensation of employees) can be found in the publications on the National Accounts.

The basis of the number of jobs in the Working Time Account is end of November statements of the number of jobs in the Establishment-related Employment Statistics (ERE statistics). Unlike in the ERE statistics WTA number of jobs also include jobs in business statistics below the activity limit

used in business statistics and also include jobs for people in eIncome not resident in Denmark.

Employment includes persons who are temporarily absent due to leave, but who have an affiliation to a workplace in the form of a job to return to. The transformation from job to employment include deduction of the persons' sideline jobs at the end of November and addition of the number of people who are either on sick leave, maternity leave or childcare leave from employment. Employment in The Register of Employment Statistics end of November (representing average employment per day in November in the WTA) includes, in addition to RAS employment also employment for persons not resident in Denmark. The Working Time Accounts employment for self-employed and assisting spouses is defined in the same manner as in the register-based labour force statistics (RAS), where self-employed consists of the following three groups: employers, VAT payers and other self-employed.

To get the average number of employees in Q4 WTA take an average of employment in October, November and December. The average employment during the year is calculated as the average number of employees in the 12 months of the year, or an average of employment in the four quarters of the calendar year. Similarly, the number of jobs in the year is calculated as the average number of jobs in each of the 12 months, where the number of jobs end of November in the Register of Employment Statistics represents the average number of jobs in the month of November in the WTA.

The concept of earnings in the WTA is the same as that used in the ERE statistics, but the population is slightly different because the ERE statistics operates with an activity limit (in accordance with international guidelines for business statistics), which is not used in labour market statistics (or economic statistics).

The revision in December 2012 implied a change in the division of labour between national accounts and work accounts so that the working time account adjusts what can be adjusted on job level, while national accounts make further adjustments on a more aggregate level. This change of labour division leads to greater differences between the working time accounts and national accounts figures. On the other hand, it implies that adjustments are made to the extent possible where the greatest expertise is. Finally, the changes in labour division also imply fewer revisions of the Working Time Accounts, which is hereby no longer dependent on the final data in the national accounts.

The new WTA also includes jobs for employees who do not live in Denmark, if they have jobs in companies in Denmark or on Danish ships. The WTA does not include employees of foreign companies working in Denmark the rules on hiring out of labour.

The compilation of Working Time Accounts is based on the idea that the figures are comparable over time to the highest possible degree. The sources will continuously be improved and replaced by other sources if these have proved to be more accurate. New sources will always be adapted to the concepts of the Working Time Accounts System. This implies that adjustments of existing sources cannot immediately be seen as changes of variables and concepts in the Working Time Accounts Statistics, although adjustments of the level of the specific variable may be made according to the new and improved information.

There may be several reasons for the lack of data comparability between the different statistics: - Differences in compilation methods - Differences in the population - Differences in the definitions - Differences in the margins of statistical errors - Differences in the time of publication.

7.4 Coherence - internal

The big improvement in relation to internal consistency between variables in the WTA is due to a system that primarily build on a single source, namely eIncome. Previously, data from many different statistics were used. See note on data breach in ATR on transition to eIndkomst.

In the transition to LMA the internal consistency increased further, mainly because there are now significantly better information of leave of absence from sickness and maternity as well as jobs and employment for self-employed and assisting spouses during the year, and that all this information is processed and overlap treated in the same system, namely the LMA. Furthermore, the internal consistency increased because the period projected using short term statistics has been reduced significantly.

8 Accessibility and clarity

The statistics are published in *News from Statistics Denmark* (Nyt fra Danmarks Statistik), in the series *Statistical News* ("Statistiske Efterretninger") and in the *Statbank Denmark* ("Danmarks Statistikbank").

8.1 Release calendar

The publication date appears in the release calendar. The date is confirmed in the weeks before.

8.2 Release calendar access

The Release Calender can be accessed on our English website: Release Calender.

8.3 User access

Statistics are always published at 9:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published. Theme publications etc. may be published at other times of the day. The National Statistician can decide that such publications may be released before their official publication time, e.g. to the media and other stakeholders.

8.4 News release

The WTA is published in News from Statistics Denmark, see.

8.5 Publications

The WTA is included in the Statistical Yearbook of Chapter **Labour, earnings and income** Section **Employment**.

A report: *Integrated labour market statistics - the Labour Market Accounts and the Working Time Accounts 1995-97* (*Integreret arbejdsmarkedsstatistik - Arbejdsmarkedsregnskab og Arbejdstidsregnskab 1995-97*) was published in December 1998. In this report, the Working Time Accounts were presented including a far more detailed description of the applied primary sources and conceptual differences between these (The report is available at Dst bookshop.

8.6 On-line database

Data are available, free of charge, from the database Statbank Denmark (Danmarks Statistikbank), see WTA-tables.

The quarterly tables are:

- ATR110: Quarterly Working Time Accounts distributed by Statistics Denmark's Industrial Classification of All Economic Activities (DB07), sector, type and socio-economic status (replaces ATR20, ATR11KV)
- ATR112: Working Time Accounts (seasonally adjusted) distributed by industrial activity (DB07 10-grouping), type and socio-economic status (replaces ATR24, ATR3KV)
- ATR114: Working Time Accounts (seasonally adjusted) distributed by sector, type and socio-economic status (replaces ATR26, ATR4KV)

The annual tables are:

- ATR116: Annual Working Time Accounts distributed by Statistics Denmark's Industrial Classification of All Economic Activities 2007 (DB07), sector, type, socio-economic status and sex (replaces ATR30, ATR11)
- ATR118: Annual Working Time Accounts on the basis of the National Accounts industrial classification by activity (DB07), sector, type, socio-economic status and sex (replaces ATR32, ATR22)
- ATR122: Index of working hours data (2010 = 100) by gender, sector and type (replacing ATR, ATRI)

The former (not continued) time series are available from StatBank Denmark under finished series.

It is not possible to draw comparisons between the new WTA and the former WTAs, as the sources, population, method and concepts have been changed compared to the previous WTAs.

8.7 Micro-data access

Data in the WTA is aggregated, where the number of hours worked, compensation of employees, the average number of jobs and the average employment summed to 6 digit industry level (DB), sector, socioeconomic status 3, sex, and 5 groups of scope of work. From this level data is summarized for publication level (including different types of industrial aggregates).

The basic material consists only of existing statistics. The primary statistical data for the compilation of quarterly working time accounts is widely stored, but detailed non-published information is not made available.

STATISTICS DENMARK

8.8 Other

The WTA transmit various data series to the EUROSTAT-STS.

STS-variable Annex A: Industrial Annex B: Construction Annex C: Retail trade and repair Annex D: Other services Employment (sts variable 210) INDEMPL CONSEMPL RTDEMPL SERVEMPL Hours worked (sts variable 220) INDHOUR CONSHOUR RTDHOUR SERVHOUR Gross Wages and Salaries (sts variable 230) INDEARN CONSEARN RTDEARN SERVEARN

In addition, the WTA delivers data to internal users, especially for the national accounts, but also to other stakeholders in relation to the short term statistical forum.

8.9 Confidentiality - policy

There is usually no need to discretionate since WTA is based on aggregated data. See also Statistics Denmark privacy policy.

8.10 Confidentiality - data treatment

There is usually no need to subjct the data to Statistics Denmarks's non-disclosure practice since the WTA is based on aggregated data.

However, data have been subjected to the non-disclosure practice in relation to deliveries to EU-STS, as some industry groups are not relevant or only relevant to a very limited extent in Denmark. These are industry 2-digit NACE groups : 'B06', 'B08', 'B09', 'C19'.

8.11 Documentation on methodology

The methods used in the Working Time Accounts is described in more detail in the series *Labour Marked* (Statistical News).

Method changes in connection with the transition to LMA is described in note data break in the WTA on transition to AMR.

Method changes in connection with the transition to eIncome is described in note data break in WTA on transition to eIncome.

A report: *Integrated labour market statistics - the Labour Market Accounts and the Working Time Accounts 1995-97* (*Integreret arbejdsmarkedsstatistik - Arbejdsmarkedsregnskab og Arbejdstidsregnskab 1995-97*) was published in December 1998. In this report, the Working Time Accounts were presented including a far more detailed description of the applied primary sources and conceptual differences between these (The report is available at Dst bookshop).

8.12 Quality documentation

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

9 Contact

The administrative placement of this statistics is in the division of Labour Market. The persons responsible are Michèle Naur, tel. +45 3917 3414, e-mail: mln@dst.dk and Pernille Stender, tel. +45 3917 3404, e-mail: psd@dst.dk

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