STATISTICS DENMARK

Documentation of statistics for Working time accounts 2024

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1 Introduction

The purpose of the Danish working time accounts (WTA) is to compile time series on hours worked and calculate wage and employment data for companies registered in Denmark. The statistics integrate and aggregate existing statistics, including the Labor Market Accounts (LMA) and Employees, and it is comparable since 2008.

2 Statistical presentation

The statistics is a quarterly and yearly calculation of hours actually worked, number of employees, number of jobs and wages in DKK million. The statistics are distributed by industry, sector, whether you are an employee or self-employed, and by gender.

2.1 Data description

The Danish Working Time Accounts (WTA), in Danish Arbejdstidsregnskabet (ATR), 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 WTA transmit quarterly data to the Eurostat short term business statistics (STS). The variables transmitted to STS are: - Number of Persons Employed - Hours Worked Paid hours worked in the jobs. - Gross Wages and Salaries

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

The WTA is not calculated at the level of individual jobs. Data in WTA are aggregated, where the number of hours worked, compensation of employees, the average number of jobs and the average employment are 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 are summarized for publication level (including various types of industrial aggregates).

2.2 Classification system

Danish Industrial Classification (DB07) (compatible to NACE rew 2) is used for classifying workplaces according to their main activity. NACE aggregatesr are use in international reports. Also, the Danish working time accounts (WTA) are broken down on national accounts industry groupings.

The workplace sector is determined using the national account sectors (ESA 2010 sectors) to make a 2 group sector breakdown: *general government* versus *Corporations and organizations*. 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 - in Danish only).

Socioeconomic status is a breakdown on three groups: employee, self-employed or assisting spouse.

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.

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2.3 Sector coverage

The statistics covers all the national accounts (ESA 2010) sectors that Danish registered companies can be assigned (i.e. all sectors excluding rest of the world and foreign-controlled entities). However, sectors are 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 non-profit organizations and sector not stated.

2.4 Statistical concepts and definitions

Employment: 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. However, there is no requirement for the number of paid working hours for employees who are temporarily absent. 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. Employment is an assessment of how many people (headcount) are employed at any given time. See detailed description of Concepts in the Danish Working Time Accounts.

Job: A job is defined as a person connected to a workplace. The same person can have several jobs at the same time. Jobs shows the number of jobs that are active (excluding temporary absences in the form of e.g. 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. 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 in the Danish Working Time Accounts.

Compensation of employees: Compensation for hours worked or for hours paid but not worked. Compensation of employees in the Danisk Working Time Accounts (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 in the Danish Working Time Accounts.

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 Danish Working Time Accounts (WTA). See detailed description of Concepts in the Danish Working Time Accounts.

2.5 Statistical unit

The statistical unit in the Danish Working Time Accounts (WTA) is the job that the person has at the individual workplace (establishment).

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 Danish working time accounts (WTA) are persons affiliated to Danish registered companies, which is consistent with European system of (national) accounts (ESA2010) boundaries. ESA2010 includes working in resident companies (see ESA 2010 paragraphs 2.04 to 2.11).

The WTA do not include employees, self-employed or assisting spouses 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 *market sector* are transmitted (i.e. ESA2010 sectors Non-financial corporations (S.11), Financial corporations (S.12), Households (S.14) and Sector not stated).

2.7 Reference area

The Danish Working Time Account covers, as in the Danish national accounts, the economic territory of the Kingdom of Denmark excluding the Faroe Islands and Greenland, which is in accordance with Commission Regulation (EC) No 109/2005.

2.8 Time coverage

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

2.9 Base period

Not relevant for this Danish release.

The new EU regulation works exclusively with indices. Index years appear in the statistics and change over time

2.10 Unit of measure

Employment is calculated as number of persons (average over the reference period).

Job is calculated as the number of jobs (average over the reference period).

Hours worked are 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.

In the new SBS regulation, only indices are published on the basis of the different units as mentioned above

2.11 Reference period

The reference period of the figures in the annual Working Time Accounts (WTA) is the calendar year whereas the reference period of the quarterly working time accounts are the quarters.

2.12 Frequency of dissemination

Annual and quarterly statistics are published. Two annual statements (in September with preliminary data for the last year, and in February with final data), and four quarterly statements are released.

The WTA transmit quarterly data to the Eurostat short term business statistics (STS). The variables transmitted to STS are: - Employees and self-employed person- Hours Worked -Paid hours worked in the jobs. - Wages and Salaries (Variable 230)

2.13 Legal acts and other agreements

-The statistics fall under Council Regulation (EC) No 2019/2152 of 27 November 2019 concerning European Business Statistics ESA / ESA: Council Regulation (EC) on the European system of national accounts:

2.14 Cost and burden

No response burden is calculated as the statistics build on existing statistical products.

2.15 Comment

The labour market and hence the working time account are strongly affected by the shutdown of society from mid-March 2020 as a result of COVID-19 and by the measures put in place to mitigate the effects of the shutdown. The exceptional circumstances in mean that the quarterly employment and hours worked figures are subject to significantly greater uncertainty than usual. See attached documentation Special conditions for publication in 2020 and in 2021 (pdf) in danish only

The system for the Working Time Accounts (WTA) 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 (in Danish only): "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.

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

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.

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 is conducted before they are projected. Data is seasonally adjusted for national use.

In the new EU statistics under Council Regulation (EC) No 2019/2152 of 27 November 2019 concerning European Business Statistics, data are trade day adjusted before being compiled into indices

3.1 Source data

The Danish Working time accounts (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 the Labour Market Accounts (LMA) 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 LMA data.

LMA form the basis of WTA on paid hours of work for self-employed and assisting spouses. In LMA 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 labour force survey (LFS). Furthermore, WTA uses the latest developments in LMA to project jobs, employment and paid hours of work for self-employed and assisting spouses.

With LMA 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 LMA, 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 2016 to be available already in August 2017.

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

Furthermore, data from the SES 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 labour 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 (LMA and employment statistics for employees) only information on paid hours of work in the month are available, the WTA 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 (AINCOME) based on reports from the Danish Central Pension System (CPS) are used for adjusting compensation of employees in the WTA to include earnings of funded 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 (secondary, third etc.) jobs 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 second quarter 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 administrative registers. Information from the wage and salary system of the 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 WTA are summarized (aggregated) prior to integration and projected so that the output data alone are broken down by socioeconomic status (whether you are an employee, self-employed or assisting spouse), industries, sectors, gender and amount of work.

3.2 Frequency of data collection

The Working Time Accounts (WTA) make use of already existing statistics in Statistics Denmark when new information is available. Typically, the ATR obtains information from the Structure of Earnings Statistics (LON) once a year (end of October). From the Labour Market Accounts (AMR) once a year (end of October) and the Income Statistics (AINDK) once a year (end of October) Employment of employees (BFL) once a month. BFL is used for the forecasting of the structural year

3.3 Data collection

The information is retrieved from these existing sources in Statistics Denmark when new data are available.

3.4 Data validation

Data are already checked for errors in the primary statistics. In the Danish Working Time Accounts (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 in Statistics Denmark.

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3.5 Data compilation

The starting point for the calculation of the average employment and the average number of jobs is the status information on the number of persons employed and the number of jobs each day of the month according to the Labour Market Accounts (LMA). When calculating the average number of persons employed or the average number of jobs in the quarter or year, this is done as an average of the 3 months in the quarter (12 months in the year), hours worked and payroll in the quarter (year) are calculated as the sum of hours worked and payroll in the 3 months in the quarter (12 months in the year). The Working Time Accounts (WTA) are statistics based on several input sources. Revisions are continuously made due to new data input sources, data breaks in existing input sources, new industry formats, new sector codes, new or changed user needs (national and international), etc.

The series are seasonally adjusted. In line with international guidelines, employment and jobs are seasonally adjusted, but these series are not trade-day adjusted. Hours worked and payroll for employees are both seasonally and working day adjusted.

In delivery to the EU statistics are trade day adjusted before the index is calculated. In Council Regulation (EC) No 2019/2152 of 27 November 2019 concerning European Business Statistics, only indexed data are provided.

The labour market and hence the Working Time Account (WTA) have been strongly affected by the shutdown of society from mid-March 2020 as a result of COVID-19 and by the measures put in place to mitigate the effects of the shutdown. The exceptional circumstances from the latter part of the first quarter of 2020 until the start of 2022 mean that the statement of hours worked is subject to greater uncertainty than usual. Similarly, the new holiday law which came into force on 1 September 2020 has caused a change in the pattern of paid hours, particularly for newly recruited officials who, unlike in the past, are entitled to paid holiday from the start of their employment.

3.6 Adjustment

The data are seasonally adjusted, but otherwise no corrections of the data are carried out beyond what has already been described during data validation and data processing.

In the national statistics, the following series are seasonally adjusted: - employment (not working day adjusted, seasonally adjusted) - jobs (not trade day adjusted, seasonally adjusted) - hours worked (working day adjusted and seasonally adjusted) - total wages and salaries of employees (working day adjusted and seasonally adjusted)

All variable types (number of jobs, employment, hours worked and payroll) are seasonally adjusted (i.e. corrected for 'fixed calendar effects'). Of the 'moving calendar effects', all variables are corrected for any Easter effects. Furthermore, hours worked and payroll are corrected for any trading day effects (including any leap year effects).

The calculations of the latest seasonally adjusted figures in particular are subject to increased uncertainty. In particular, the COVID-19 crisis has triggered large and unusual fluctuations in the non-seasonally adjusted hours worked figures, and the result of the seasonal adjustment should therefore be used with caution. When the seasonally adjusted values are subject to greater uncertainties than usual, this could also lead to greater ex-post revisions than usual.

Seasonal adjustment will itself lead to revisions in previously published seasonally adjusted figures - even if there are no changes in the historical non-seasonally adjusted figures. For the national publication, the seasonal adjustment is made on monthly data broken down into 19 industries (standard db19 grouping), each of these further broken down into two sectors (*public administration and services* vs *enterprises and organisations*). The series are further divided into 3 socio-economic groups (employees, self-employed and assisting spouses). Where seasonally adjusted values are not available, actual values are used instead. When seasonally adjusted data are added to the database, the main figures are calculated by indirect seasonal adjustment as the sum of the seasonally adjusted breakdowns for the sub-groups (Socio-economic status 3 * sector2 * db19).

For the purposes of Eurostat's STS Regulation, seasonal adjustment is not applied, but only trade-day adjustment, and is provided as index calculations. The following data are provided 1. employment (index calculation only) 2. hours worked (working day adjusted and indexed) 3. hours worked (indexed only) 4. compensation of employees (working day adjusted and indexed) 5. compensation of employees (indexed only)

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. In addition, data from the Working Time Account (WTA) are transmitted to various international institutions, eg. Eurostat, OECD, ILO.

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 (WTA) 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

In the reports to the European business short term statistics (STS) the population has previously been larger than the market sector 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.

In the period from the statistics was revised to be based on eIndkomst (in December 2012) and until the revision, where WTA was revised to be based on the labour market accounts (LMA) in September 2016, the delimitation of deliveries to the STS has been the sector group *Corporations and organizations*, ie. excluding *General government*.

With the revised statistics 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 system is available in more detailed sectoral codes.

5 Accuracy and reliability

The statistics is mainly based on the Labour Market Accounts (LMA). LMA integrates and harmonizes a wide range of data sources in a statistical system. This means that LMA can illustrate the labour market better than individual statistics can. LMA is at the same time based on a total census of the population, so there is not the same uncertainty as with statistics based on sampling. The quality of the statistics has also been significantly improved by the fact that the projection period has been reduced compared to previous versions.

5.1 Overall accuracy

The margins of statistical uncertainty are related to the statistical uncertainty of the individual primary statistical data that are used.

The statistics is mainly based on the Labour Market Accounts (LMA), which is a longitudinal register based on integration and harmonization of a large number of registers in Statistics Denmark. This means that LMA can illustrate the labour market better than individual statistics can. LMA is at the same time a total census of the population, so there is not the same uncertainty as with statistics based on sampling. Data is available at a very detailed level, which makes the delimitation of the population and concepts very accurate. Against this background, quality is judged to dump other labour market statistics at home and abroad.

The quality of paid hours is not as high as other concepts in the LMA, but relatively high compared with survey-based statements. In contrast to survey-based statements, where they ask the employed themselves how many hours they work, and as a result, among other things, is subject to memory and random sampling, the registry-based working hours are based on the administrative payroll systems that are also reported to the Danish Customs and Tax Administration. Because the information is thus linked to both income and tax payments, they are considered to be relatively high quality. It also means that hours worked are limited to not including illegal activities and unpaid hours of work, which are information that, for natural reasons, is not available in administrative sources. Illegal activities and unpaid hours are information that can only be provided by surveys asking the employed themselves. Thus, this information is subject to both the memory and the willingness of the employed to respond. Also due to sampling errors the information will only be available at a relatively aggregated level.

Information on pay hours of work is from the Employment Statistics for Employees (BfL), where paid hours of work are sometimes imputed and therefore there is uncertainty related to this information. However, the proportion of imputed pay hours for employees has fallen from 2008, where the share was more than 14 per cent to less than 2,5per cent by 2022. There is greater uncertainty about the paid hours of work for self-employed and assisting spouses. This is due to the fact that hourly information for self-employed and co-spouses is imputed on the basis of paid hours for employees from BfL adjusted by how much more self-employed and assisting spouses say they work compared to employees in the labour force survey (LFS). The Working Time Accounts (WTA) converts paid hours from the LMA at job level to hours worked using factors calculated using the annual Structure of Earnings at a more aggregated level. The hourly information is considered to fit an overall level, but at the detailed level they should be interpreted with caution.

Since data includes provisional structural data from the Labour Market Accounts (LMA), the projection period in the WTA has been reduced compared to earlier versions of the WTA so that the maximum length of projection is 18 months. The 18-month projection occurs in the calculation of Q2 in September, while for example the calculation of Q# in December only will be projected for six months. This increases the quality of the statistics considerably compared to previous versions of the WTA. By combining structural and short term statistics, both high-quality data from structural statistics and statements of recent periods using faster short term statistics is obtained. In addition, it contributes to the consistency of the WTA both over time and between variables, that the main source used for projection is employment for employees (BfL), which is also the main source of employees in the LMA.

5.2 Sampling error

Not applicable to this statistic as data is not based on samples.

5.3 Non-sampling error

Specific conditions for publication in 2020, 2021 and 2022

The labour market, and hence the Working Time Accounts (WTA), have been strongly affected by the shutdown of society from mid-March 2020 as a result of COVID-19 and by the measures put in place to mitigate the effects of the shutdown. The exceptional circumstances in the latter part of the first quarter of 2020 and up to the start of 2022 mean that the statement of hours worked is subject to greater uncertainty than usual. Similarly, the new holiday law which came into force on 1 September 2020 has caused a change in the pattern of paid hours, particularly for newly recruited officials who, unlike in the past, are entitled to paid holiday from the start of their employment.

Employment: Employment of employees (BFL) is one of the main sources of the Working Time Accounts. The closure and the measures to mitigate its effects affect the employment account, but the impact is limited by the fact that employees temporarily absent from work continue to be included as employed. This also applies to employees who have returned home without working, including employees for whom the enterprise receives compensation of employees.

Hours worked and COVID-19 restrictions: The shutdown and mitigation measures have significantly reduced the number of hours worked. To reflect this, the usual calculation of hours worked has been corrected on the basis of new alternative sources.

Seasonal adjustment: The seasonally adjusted series are generally more uncertain than usual due to atypical labour market developments in 2020, 2021 and 2022 as a result of COVID-19.

In general, the quality of data has improved significantly with the use of the new eIncome sources, and even better with the transition to using AMR. Previously, the ATR was calculated by compiling data from many different sources. After the 2012 changeover, the ATR relies primarily on eIncome sources. Thus, the data basis became the same for most of the sources included in the ATR, ensuring a high degree of internal consistency. The transition to AMR improved accuracy once again by integrating and harmonising a very large number of data sources into one statistical system. This means that the AMR can shed much more light on the labour market than the current stand-alone statistics can, particularly in relation to the periodisation of transitions from one labour market status to another. At the same time, the AMR is a total census of the population and thus does not have the same uncertainty as sample-based statistics.

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.

5.6 Quality assessment

The margins of statistical uncertainty 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, is the Labour Market Accounts (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 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 are subject to a relatively greater degree of uncertainty than it is for employees.

When the Labour Force Survey (LFS) is applied in the Labour Market Accounts (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 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.

There is associated uncertainty in relation to developments in hours actually worked over the year. In the Danish Working Time Accounts (WTA) the development is identified by paid hours for hourly workers, who have not paid absence. As described in the section on sources, in the calculation of hours actually worked, conversion factors are used which are calculated as the relative distribution of hours actually worked compared to paid hours over the months of the year. The development in the ratio between hours actually worked and paid hours over the year is calculated on 19 industry groups. The assumption here is that the time distributions over the months of the year for hourly

workers in each of the 19 industry groups represents the hour distribution for all the employed in the same industry groups. This information is used to convert reports of paid hours from eIncome over the year to monthly information on hours actually worked over the year in the WTA. Because of compensated absences as holidays and sickness etc., the distribution on paid hours and hours actually worked is not the same throughout the year.

In the absence of structural statistics (SES and LMA for 2018), the relative distribution of hours actually worked compared to paid hours over the year's months is based on previous year's allocations. This implies an inevitable uncertainty. Easter has significant impact on the distribution of hours actually worked between the first and the second quarter.In 2018 the Easter holidays fell primarily in March, but a few fell in the month of April. The only year in the time series, where Easter fell approximately in the same way is 2013. However, there was a lockout in April 2013 in public line of industries. This is why 2016 has been used to distribute hours worked for public industry group activities (NACE groupings *Public administration and defence compulsory social security*, *Education* and *Human health and social work*), as Easter fell in March in 2016. The actual distribution of hours worked between the first and second quarter very much depends on how the persons in employment take their Easter break up to and after Easter. In September 2019, hours actually worked will be published in the Working Time Accounts, in which data based on Structural earnings 2018 and The Labour Market Accounts for 2018 have been incorporated.

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 (WTA) will be 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 both in a provisional version as well as a final version, so 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 (the Labour Market Accounts 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 annual Working Time Accounts (WTA) are published 6 months after the reference year. The quarterly WTA are published two months and 15 days after the reference quarter.

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

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6.1 Timeliness and time lag - final results

The Danish Working Time Accounts (WTA) are published with provisional quarterly figures 4 times a year (1.st Quarter mid-June, 2nd Quarter mid-September, 3rd Quarter mid-December and 4th Quarter mid-March). Provisional annual statements are normally published in September and final annual statements are normally published in February.

Final annual figures are normally published in December of the year following the reference period. The working hours account is thus published once a year with the year stated in December, incorporating the new structural year from the Labor Market Accounts and Wage Structure Statistics.

There is consistency between the annual and quarterly WTA so that quarterly data is also final for periods where final annual statements are available. However, there may temporarily be differences between the annual and quarterly tables, if the publication dates are not the same.

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 plus 2 months and 15 days. For the annual statistics the guiding target is by the end of the following year.

6.2 Punctuality

95 percent (21 out of 22 publications) of the Quarterly statements have been published exactly as planned or ahead of schedule since the transition to eIncome basis December 2012.

The annual statistics has since December 2012 been released four times, all at pre-announced time (100 percent.). However, final structural data for the reference year 2017 have already been incorporated in connection with the publication of the annual ATR dated 11/10 2018, replacing the publication that would normally take place in February 2019.

Data to Eurostat short term business statistics (STS) are evaluated based on requirements for interim STS quarterly (within 2 months after the reference quarter) and here meets 85.7 percent the requirements (18 out of 21 deliveries since the system was revised to eIncome basis in December 2012).

For the final STS quarterly data 90.9 per cent (20 out of 22 of the releases) were transmitted according to the required deadline (within 2.5 months after the reference quarter).

7 Comparability

The Working Time Accounts (WTA) provide data for Council Regulation (EC) No 2019/2152 of 27 November 2019 and for the National Accounts (SNA/ESA). Changes in these will typically lead to changes in the ATR. For an explanation of transition tables between ATR and SNA/ESA, see National Accounts publications.

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7.1 Comparability - geographical

The statistics are worked out according to international guidelines, European System of Accounts (ESA 2010) and International Labour Organisation (ILO 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 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 day-time population'). ILO guidelines include the resident population (colloquially called 'the night-time population').

7.2 Comparability over time

From the fourth quarter of 2019 and onwards, the payroll is incorporated so that accrued holiday pay is recorded at the time of earning and not, as previously, at the time of payment.

Otherwise, there is no data breach in the current ATR time series. But compared to historical versions / releases of WTA, there have been the following data breach:

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 longitudinal data from the new Labour Market Accounts (LMA). 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 in September 2016 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. In February 2017, the preliminary data from LMA for 2015 is replaced with final data for 2015. There is therefore a significant improvement in quality of the WTA. The revision of the WTA on transition to the LMA has given rise to minor revisions in the levels of employment, jobs, hours worked and compensation of employees:

Size of the WTA revision upon transition to LMA (pct.):

In December 2012 the Working Time Accounts (WTA) were adjusted, implying that new data sources (primarily based on eIncome) are used for the compilation. 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. See Break in WTA on transition to eIncome.

With eIncome the target population was expanded to include people who work in Danish companies but live abroad:

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]https://www.dst.dk/ext/arbe/WTAbreak).

Earlier versions of the Working Time Accounts (WTA) have been used to write-back the current series to 1995. However, these back-written series are not used for separate disclosure, as the quality is not good enough at the detailed level published in the WTA.

But the series are used to write-back the National accounts employment data series, see for example:

- Quarterly national accounts, industries: NKBB10: Employment (10a3-grouping) by socioeconomic status, industry and seasonal adjustment.
- Annual national accounts, industries: NABB69: Employment (69-grouping) by socioeconomic status and industry.

In addition, the back-written series are used in deliveries to the Eurostat Short Term business Statistics (STS), but on the condition that they may not be published separately but solely together with series from other countries.

7.3 Coherence - cross domain

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

The WTA are worked out according to international guidelines.

However, since the WTA is primarily a register-based statistic, it does not include information on unpaid overtime and illegal (including undeclared) hours of work. In the Labor Force Surveys (LFS) and in the National Accounts, the hourly concept includes unpaid overtime and illegal (including black) work, as explained by respondents in LFS.

Transitional tables between the WTA and the RAS: Register-based Labour Force Statistics (employment) and the ERE: Establishment-related Employment Statistics (jobs and compensation of employees) is published in Statistical Reports (Statistiske Efterretninger in Danish only) 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 (secondary, third etc.) 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 an average of employment in October, November and December is used. 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 Danish only) and in the Statbank Denmark. You can read more on our website on the Working Time Account, WTA and our website on employment.

S.6.2. Data sharing: In addition to quarterly figures to Eurostat (STS and indirectly via ESA), data from the Danish WTA are also transmitted to OECD (regional questionnaire) and ILO (ILOSTAT database) although the latter are transmitted in annual figures only.

8.1 Release calendar

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

8.3 User access

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

8.2 Release calendar access

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

8.4 News release

The Working Hours Account (WTA) is only published as tables in the statistics database."

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8.5 Publications

The Working Time Accounts (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 from the Danish Working Time Accounts (WTA) are available, free of charge, from the database Statbank Denmark, 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 socioeconomic status (replaces ATR20, ATR11KV)
- ATR112: Working Time Accounts (seasonally adjusted) distributed by industrial activity (DB07 10-grouping), type and socioeconomic 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 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.

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8.8 Other

The statistics transmit various market sector data series to the EUROSTAT-STS (regulation on business short term statistics).

In addition, the statistics delivers data to internal users, especially for the national accounts.

8.9 Confidentiality - policy

There is usually no need to discretionate since the statistics is based on aggregated data. See also Data Confidentiality Policy at Statistics Denmark.

8.10 Confidentiality - data treatment

There is usually no need to subject the data to Statistics Denmark's non-disclosure practice since the statistics 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 (WTA) are described in more detail in the series *Labour Marked* (Statistical Reports - in Danish only).

Method changes in connection with the transition to the Labour Market Accounts (LMA) are described in note data break in the WTA on transition to AMR.

Method changes in connection with the transition to eIncome are 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 Statistics Denmark's 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

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