

## Metadata

# Wage Index

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### **0. Registration entry for subjects**

#### **0.1 Name**

Wage Index

#### **0.2 Subject area**

Wages and income

#### **0.3 Responsible authority; office, division, person etc.**

Statistics Iceland

Wage statistics

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#### **0.4 Purpose and history**

The wage index is a monthly price index and is calculated and published according to the legal act No 89/1989. An aggregated index for the entire labour market has been published monthly since January 1989. According to the legal act the index is intended to reflect, to the extent possible, changes in total wages of all employees paid for fixed hours excluding irregular payments. Employers' social contributions and taxes are excluded. Calculation of the index is based on a comparison of wages for two consecutive months.

The historical roots of the wage index are related to the indexation of financial obligations in Iceland. From year 1979 indexation was based on a composite index based on 2/3 of changes in consumer prices and 1/3 of changes in building costs. This was changed in early 1989 to 1/3 of changes in consumer prices, 1/3 of changes of building costs and 1/3 of changes in wages. As a consequence each part needed to be calculated on a monthly basis. This led to the need for a legal basis for the wage index and in longer terms a renewal of the existing data collection on wages. The legal base for the indexation of financial obligations was changed in

1995 to rely solely on the Consumer Price Index. From that time the wage index has been commonly used for indexation of contracts and for economic and labour market analyses.

## **0.5 Users and application**

Users of the wage index and sub-indices are individuals, private business enterprises, national and international organisations, employees' organisations and employers' associations, ministries and public institutions. The wage index is a price index that measures changes in regular hourly wages in the Icelandic labour market. The index is based on sample data.

## **0.6 Data sources**

The wage index is based on the data collected through the Statistics Iceland Icelandic survey on wages, earnings and labour costs (ISWEL). The survey is based on a sample of private companies and municipalities (local government) with 10 or more employees. In addition, data are collected directly from the central government for all its employees. The data collected monthly directly from the employers' payroll systems contain all labour costs and paid hours as well as background information on employees and employers. Validations checks are performed in accordance to predefined rules in order to eliminate or fix data items that are incorrect. The ISWEL is in accordance with regulations on surveys on earnings and labour in the European Economic Area. The ISWEL sample and weights are based on the PAYE (Pay as your Earn) data.

## **0.7 Legal basis for official statistics**

Statistic Iceland releases both a total index according to the legal act and as sub-indices to better serve users' needs. While the total wage index is a legal requirement, Statistics Iceland is not obliged to publish any sub-indices. The total wage index is based on the Act on the Wage Index No 89/1989 that stipulates that a wage index shall be based on the averages wages for each month and be published after the middle of the following month. In general, all statistics collected, generated and disseminated by Statistics Iceland are governed by act on Statistics Iceland No. 163/2007.

## **0.8 Response burden**

The survey, ISWEL, is based on a lengthy tradition of collecting data directly from employers by using the software each employer uses for calculating wages, i.e. from the administrative records of the employers. Monthly, each employer sends a data file containing detailed information on earning structure and cost items, together with background data on the employee and the employer. Taking advantage of data collection by direct access minimises the bias caused by recording. Moreover, the expense and nuisance employers might associate with data collection and the time lost through reporting is kept to a minimum. This is important, as it improves data quality and helps maintaining a representative sample for each calculation of the wage index. In order to collect metadata on each employer and its pay structure, great effort is spent on the inclusion process for each employer as it enters the

survey. Feedback to the employer is given during data collection, if necessary, to maintain quality of data.

## **0.9 EEA and EU obligations**

No specific EU or EEA regulations apply. However, Statistics Iceland takes notice of regulations No 530/1999 from March 9th 1999, No 1916/2000 from September 8th 2000 and No 530/1999 regarding economic reports and the construction of ISWEL.

# **1. Contents**

## **1.1 Description of content**

The base of the wage index is December 1988. The base for the sub-indices is, however, December 2014 for monthly sub-indices and average 2005 for quarterly sub-indices.

### *Calculation of the index*

The wage index is based on (weighted) changes, between two consecutive months, of regular hourly wages paid to an employee for fixed working hours within the same occupation, the same economic activity and by the same employer. Törnqvist index formula is used at lower aggregation levels and a matched sample model with the smallest aggregate being the item itself, i.e. the hourly wage for a given set of working hours within a given occupation and given economic activity. At top-level the sub-indices are aggregated according to Laspeyres' formula since weights at this level are updated once a year. Each economic activity and occupation group is given a weight based on their share in total wages. The weights for occupation groups and economic activity are revised annually (the weights are discussed in detail below).

### *Matched sample model*

To control for quality changes matched models structure is used where the elementary aggregate is the regular hourly wages paid to an employee for fixed working hours within the same occupation, the same economic activity and the same employer between two consecutive months. Occupations are down to a five digit number. A four digit number according to the Ístarf95 occupation classification of Statistics Iceland (based on ISCO-88) and in addition there is a 5th digit in the occupational code to distinguish the status of the employee, i.e. general worker, foreman and craft worker. In order to be considered as being in the same occupation in two consecutive months the 5 digit classification number has to be the same in both months. Economic activities down to a 5 digit level are classified according to ISAT08 which is the Icelandic equivalent to NACE rev. 2 classification. To be considered being in the same economy activity in two consecutive months the 5 digit classification number has to be the same in both months.

### *Data coverage*

The wage index is based on sample data, ISWEL. Included are following economic activities according to Ísat2008<sup>1</sup>: C, D, E, F, G, H, J (only economic divisions 58–61), K, M (only economic division 71), O, P and Q. Within these economic activities there are approximately 145 thousand employees or  $\approx 74\%$  of the total number of employees. The size of the sample in the year 2017 was approximately 100 thousand employees or  $\approx 50\%$  of the total number of employees in the labour market.

## **1.2 Statistical concepts**

### *Regular hourly wages*

The wages used in the calculation of the index are regular hourly wages, i.e. all basic wages paid for both day-time and shift-work hours as well as fixed wage contract hours, including additional payments like fixed overtime and bonuses settled regularly in each wage period by the employers. Overtime and other irregular payments are excluded as well as employers' social contributions and taxes.

### *Population*

The population is defined as all employees 18 years or older working at companies and municipalities with 10 or more employees and employees 18 years or older working for the central government. The population frame is based on the monthly Pay as You Earn (PAYE) data.

### *Sectors*

From 2018, sectors are based on the ESA 2010 classification of National Accounts. The public sector only consists of the General Government (S.13; i.e. the municipals and the central government with some exception, see the ESA 2010 classification for details). Others belong to the private sector. Until 2017, the public sector consisted of those getting remunerated by the municipalities or by the Central Government Accounting Office. There are only small differences between those two definitions.

In the private sector the wage index is based on data collected from companies operating in the following economic activities in the private sector: Manufacturing (C), Electricity and steam supply (D), Water supply and waste management (E), Construction (F), Wholesale and retail trade (G), Transportation and storage (H), Information and communication (J - only divisions 58–61, Information Technology - divisions 62–63 are missing), Financial and insurance activities (K) and engineering activities (M - only division 71).

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<sup>1</sup> <https://hagstofa.is/media/49171/isat2008.pdf>

In the public sector the wage index covers employees in a sample of municipalities, including the capital city Reykjavík (local government), as well as data on all employees from the Central Government Accounting Office (central government).

### *Weights*

The calculation of the wage index involves a standard structure of expenditure weights which are calculated for all sub-levels of the index, that is for elementary aggregates, cell – aggregates (for occupation + economic activity cells/federation of trade unions) and economic sectors.

An employer expenditure weight is based on the ISWEL sample design. In the private sector the employers' weight is based on the expenditure weight of the sample layer (NACE division and size). A comparable approach is used to determine the weights of the local government (sample of municipalities). All employers in the central government have the weight 1 as data are close to census data. The employer expenditure is fixed yearly.

Weights on the level of the elementary aggregates are based on a combination of the employers' weight and the expenditure of an employee within a cell (defined by occupation and economic activity in the private sector and federation of trade unions in the public sector) in the ISWEL. The expenditure for each employee is computed each time the wage index is computed.

Expenditure weights for cells (defined by occupation and economic activity) in the private sector are based on the expenditure of the economic activity, including employer with less than 10 employees, in the PAYE data and the expenditure of occupational groups in the ISWEL data. In the public sectors the weights for cells (defined by federation of trade unions) are based on the ISWEL data. The cell expenditure weights are fixed yearly.

Expenditure weights for economic sectors are based on the total expenditure, including employer with less than 10 employees, in the PAYE data. The sector expenditure weights are fixed yearly.

## **2. Time**

### **2.1 Reference periods**

Reference period for the wage index is the previous month. For example the wage index for January is published around 20-24<sup>th</sup> of February and is based on comparison of wages between December and January. The sub-indices for January are published around 20-24<sup>th</sup> of April.

### **2.2 Processing time**

Processing time for the total wage index is 20–24 days. Processing time for the sub-indices is 80 to 90 days.

## **2.3 Punctuality**

The wage index is published according to the advance release calendar at 9:00 am the day of publication. The advance release calendar for each year is published on the website of Statistics Iceland <https://stative.is/>.

## **2.4 Frequency of releases**

Monthly releases on Statistic Iceland's website <https://stative.is/>.

## **3. Reliability and security**

### **3.1 Accuracy and reliability**

The Icelandic survey on wages, earnings and labour costs (ISWEL) is a sample survey. The sample is a stratified cluster sample where the sample unit is the employer and the observation unit is the employee. The target population of companies contains all employers with 10 or more employees (see section Private Sector above). The population frame is based on monthly PAYE data. The PAYE data reflects the sum of wages reported to the tax authorities. The population frame and the sample are revised yearly in order to adjust it to changes in employer's environment from the last revision, but a systematic sample refresh has not yet been implemented due to lack of coverage.

The companies are stratified in divisions according to NACE Rev. 2 (two first digits). Companies where the number of employees is higher than the average in the company's division are selected with probability of 1. The rest of the companies are further split into medium size and small size companies within each section and selected randomly from the corresponding stratum.

During visits to employers in the sample, technical aspects concerning the software for wage calculations are addressed along with details on entering records such as classification of occupations according to the ÍSTARF95 and ÍSAT2008 standards. The employer's wage structure is examined assigning payroll items to the wage items of the survey to ensure coordination with other employers. The pool of employer is revised yearly. Efforts are continuously made to improving data quality through feedback to the employers and through updating and improvement of the validation checking system. Validation checks are made continuously and data is edited by using a set of predefined rules.

There are not fixed cut-offs regarding outliers in the data, but predefined rules used to handle and examine the outliers. Cut-offs are applied in the calculation for data entries of the first three and the last three months for each elementary aggregate, i.e. the hourly wage for a given set of working hours within a given occupation and given economic activity. Cut-offs also applies when working hours are either under 10 or over 340 per month. Those entries are eliminated from calculation of the index because experience has shown that it is common that the wages are abnormally fluctuating when employment starts or is terminated.

### **3.2 Sources of errors**

In the calculation of the wage index various errors can arise, e.g. sampling errors (coverage errors, non-response errors) which may occur if the sample does not reflect the population accurately. Errors can arise if employers are incorrectly registered according to their economic activity classification in the sample frame; in cases of employers operating in more than one economic activity but only registered in one of it; if newly established companies are not a part of the survey's pool, etc. The wage index is subject to challenges because of lack of data coverage and due to inadequate sample refresh.

The wage index can also be subject to various errors and biases known to affect general price index numbers like quality changes, chaining effect and the influence of life cycles. Estimation of the chaining drift and life cycle error for the wage index can be found in a working paper from August 2018, see: <https://statice.is/publications/publication/wages-and-income/methodology-of-the-icelandic-wage-index/>

### **3.3 Measures on confidence limits/accuracy**

Not calculated.

## **4. Comparison**

### **4.1 Comparison between periods**

The wage index adequately represents changes in wages at each time point and the changes can be compared between time points covered by the index. However, over the time the data collection has changed and data has improved in more recent times. Calculations have been adjusted to such changes.

### **4.2 Comparison with other statistics**

The wage index is intended to be an indicator of general monthly hourly changes in wages since 1989. Several sub-indices has been published since 2005 and are intended to reflect changes in regular wages in the private sector by occupational groups and economic activities as well as overall changes in regular wages for the level of administration in the public sector.

The regular hourly wages used in the wage index is equivalent to regular wages in average Earnings Statistic Iceland's publication. However, the wage index measures the changes, in wages paid by employers for one hour of work, which should not depend on structural changes of the market or on the quality and quantity of the labour while average Earnings is designed to incorporate these effects. Thus, if an analysis is focused on the changes of average wages that reflect structural change in the labour market, then average Earnings should be the preferred measure (or Quarterly Total Wage Index). On the other hand, if an analysis is concerned with the price change of wages then users should consider using the wage index. For example, the average wage may change if the availability of cheap workflow changes, where only changes in wages may affect the results of the index calculations.

### **4.3 Coherence between preliminary and final statistics**

Preliminary statistics are not published. However, changes between two given consecutive months are calculated three times. After the first calculation for a given month (T), that given month is revised twice (in months T+1 and T+2) and those revisions contribute to the index value for latest months (T+1 and T+2). For example, the index value of June 2018 includes wage changes in June 2018 but also readjusted values of the changes in April and May 2018. The recalculations are necessary, due to strict demand for timeliness for the total wage index, to compensate for data delays and data errors.

## **5. Access to information**

Statistics Iceland operates in accordance with the [United Nations Fundamental Principles of Official Statistics](#), [the European Statistics Code of Practice](#) as well as [the Act on the Protection of Privacy](#) regarding the processing of personal data. Furthermore Statistics Iceland has laid down its own [Rules of Procedure for Treating Confidential Data](#).

### **5.1 Disseminations**

The wage index and other indices are published monthly as a press release in accordance with the released calendar that can be found on the website of Statistics Iceland (<https://statice.is/publications/news-archive/advance-release-calendar/>). The total wage index is published monthly about 20-24 days after the end of the reference month and is accessible from 1989 and onwards. About 80–90 days after the reference month several sub-indices are made accessible on Statistics Iceland's website. Among these indices are indices that show changes in economic activity groups and occupation groups in the private sector and level of administration for the public sector. These sub-indices are:

Monthly wage index by sector from 2015 and onwards.

Monthly wage index in private sector by occupational group from 2015 and onwards.

Monthly wage index in private sector by economic activity from 2015 and onwards.

The following older tables with quarterly sub-indices are maintained:

Quarterly wage index by sector from 2005 and onwards.

Quarterly wage index in private sector by occupational group from 2008 and onwards.

### **5.2 Original data, storage and accessibility**

The original data is stored by Statistic Iceland and is not accessible to others than employees analysing the data.



### **5.3 Reports**

Press releases are published monthly on the wage index. Working paper on the methodology of the index was published in August 2018, see here: <https://statice.is/publications/publication/wages-and-income/methodology-of-the-icelandic-wage-index/>.

### **5.4 Other information**

Further information is provided by the department of Wages, income and education.

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