



# Wages statistics: Concepts, definitions & derived variables

Monica Castillo,  
Chief, Standards and Methods Unit and Senior Statistician  
ILO Department of Statistics  
[castillom@ilo.org](mailto:castillom@ilo.org)

Capacity Building Workshop on Work Statistics,  
Working time, Informality and Wages statistics  
For SADC Social Partners  
Johannesburg, South Africa  
October 6th – 9th October 2015

ILO Department of Statistics

## Topics

- ILO Convention 95: Protection of Wages Convention (1949)
- Objectives and uses of wages statistics
- International statistical standards on wages statistics
- Statistical concepts and definitions using the component approach
  - Wage rates
  - Earnings
  - Employment-related income
    - Income related to paid employment
    - Income related to self employment
  - Compensation of employees
  - Labour cost
- Derived earnings variables & an integrated system of wages statistics

## ILO Convention 95 Protection of Wages Convention, 1949 (1)

### *Definition of wages (C95, Article 1)*

*"In this Convention, the term **wages** means remuneration or earnings, however designated or calculated, capable of being expressed in terms of money and fixed by mutual agreement or by national laws or regulations, which are payable in virtue of a written or unwritten contract of employment by an employer to an employed person for work done or to be done or for services rendered or to be rendered."*

**Note:** ICLS statistical standards differentiate between wage rates and earnings (12<sup>th</sup> ICLS, 1973)

## ILO Convention 95 Protection of Wages Convention, 1949 (2)

### **Key highlights:**

- Allows partial payment of wages as allowances in kind
- Deductions permitted only according to laws, regulations, collective agreement or arbitration award
- Wages assigned only in a manner and within limits prescribed by national laws or regulations
- Wages shall be paid regularly
- Some aspects revised in 1992 by ILO Convention 173: Protection of Workers' Claims (Employer's Insolvency) Convention

For more information, see ILO C95 Protection of Wages Convention, 1949 and C173 Protection of Workers' Claims (Employer's Insolvency) Convention, 1992; web links:

<http://www.ilo.org/ilolex/cgi-lex/convde.pl?C095>  
<http://www.ilo.org/ilolex/cgi-lex/convde.pl?C173>



## Objectives and uses of employment-related income and wages statistics

- **Key objective** is to provide information on:
  - Wage and employment-related income **levels**
  - Wage and employment-related income **trends**
- **Uses:**
  - Measurement of level of living of workers
  - Wage fixing
  - Collective bargaining
  - Economic indicators
  - Income distribution studies
  - Empirical data and wage theories
  - Economic, social and manpower planning, research, analysis
  - Wage, income and price policies



## Statistics needed: examples using earnings concept

- **Levels, Structure (composition), and Distribution:**
  - In 2003, Mexican employees earned on average, 21 pesos per hour; women earned 20 and men 21;
  - In Switzerland in 2006, 0.4% of earnings were due to overtime, 0.7% due to hardship allowances, 6.2% due to end of year bonuses and 4.8% in other bonuses;
  - In 2004-05, the 20% lowest paid employees (first quintile) in Australia earned on average 218 Australian dollars representing 7,2% of total income; the 20% highest paid persons (fifth quintile) earned 1202 dollars, representing 39,4% of all income.



## Statistics needed: requirements

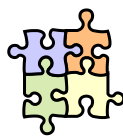
- Should cover ALL workers in the economy
  - Paid employees in the formal economy,
  - Workers of the informal economy,
  - Self employed.
- Should be disaggregated by relevant variables
  - Sex, age, status in employment, education level, occupation, kind of activity, type of workplace, size of economic unit, etc.
- Should be presented together with other bodies of statistics
  - In combination with statistics on prices, employment and hours of work, household composition, other labour market indicators

7



## Different income concepts relate to different functions

- As a price of labour
  - Concepts: Wage rates
- As the employment income (wellbeing) of workers
  - Concepts: Earnings, employment-related income related to paid employment and to self-employment
- As a cost to the employer (firm costs, revenues, profits)
  - Concepts: Labour cost, compensation of employees

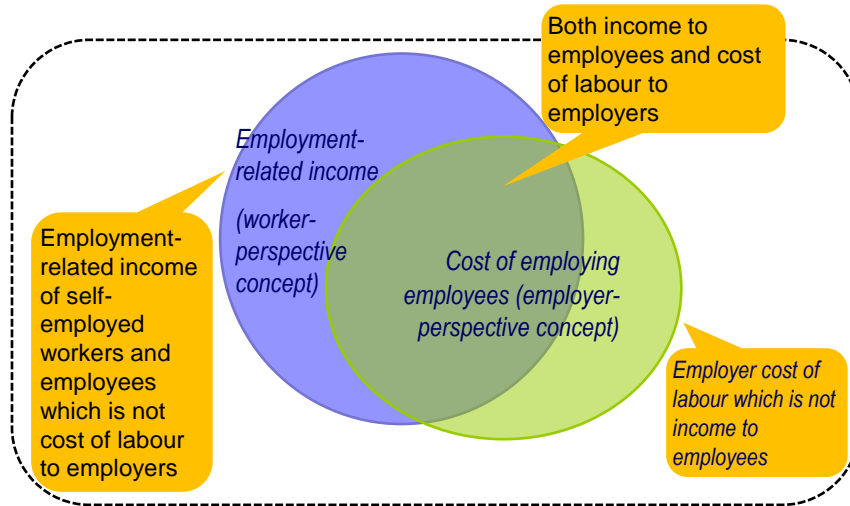


*No unique concept applicable to all circumstances*

*Use a component approach*

8

## Relationship between employment-related income and cost of labour



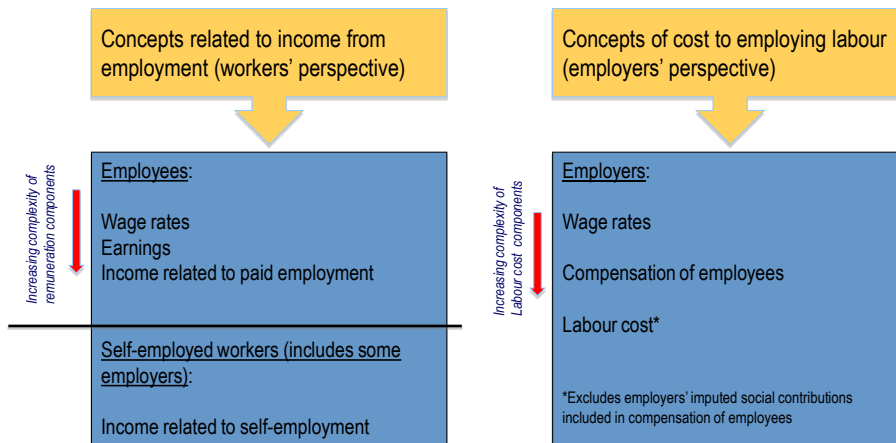
## International statistical concepts

- Topic has been discussed in international conferences since 1923
- Different international statistical concepts:
  - Wage rates (12<sup>th</sup> ICLS, 1973)
  - Earnings (12<sup>th</sup> ICLS, 1973)
  - Compensation of employees (SNA, 1993)
  - Labour Cost (11<sup>th</sup> ICLS, 1966)
  - Income related to paid employment (16<sup>th</sup> ICLS, 1998)
  - Income related to self employment (16<sup>th</sup> ICLS, 1998)
- Why so many? Different perceptions

## Different perceptions

- Depend on who you are
  - Employee, employer, government planner, policy maker, journalist, research worker, teacher, etc.
- Depend on what you want to do
  - Fix levels of wages
  - Compare standards of living
  - Fix contributions to social security
  - Set income tax rates, etc.
- Depend on why you want to do it
  - Redistribute income, improve levels of living, generate tax revenue, reduce costs, etc.

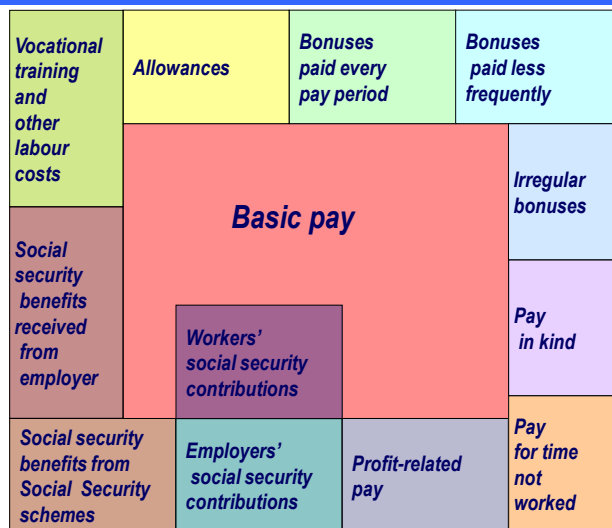
## Concepts of employment-related income and cost of labour from worker and employer perspective



## International statistical concepts. Wage rates, earnings and labour cost:

### Measurement through a component approach

## The Component Approach



## Wage Rates Definition (12<sup>th</sup> ICLS, 1973)

**Definition:** *Wage rates include basic wages, cost-of-living allowances and other guaranteed and regularly paid allowances.*

- Wage rates **exclude**: overtime payments, bonuses and gratuities, family allowances and other social security payments made by employers. *Ex gratia* payments in kind, supplementary to normal wage rates, are also excluded.
- Data on time rates of wages should relate to an appropriate time period such as the hour, day, week, month or other customary period used for purposes of determining the wage rates concerned.

For more information: see the Resolution concerning an integrated system of wages statistics, adopted by the Twelfth International Conference of Labour Statisticians, 1973, web link:

[http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_087496.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087496.pdf)

## Wage rates (12<sup>th</sup> ICLS, 1973)

- Price of labour per unit of time or output
  - Time rates of wages – paid by unit of normal working time (e.g. hours, day, week, month, year)
  - Piece wage rates – paid by unit of output
    - Applied to individual workers or to teams of workers
    - Differential piece rates may exist
- Relates to the income associated with a job, not with the worker
- Similar to a price quotation



## Fixed versus actual wage rates

- Wage rate data may reflect:
  - Wages rates fixed by law, regulation, collective agreements, arbitral awards (usually scales) OR
  - Actual wage rates paid

**Note: actual wage rates paid may differ from fixed wage rates**

## Wage rates

*Adopted by the  
12<sup>th</sup> ICLS in 1973*

*Relates to the price  
of labour per unit of  
time or output - as  
negotiated between  
employees and  
employers*

**Allowances**

**Basic pay**

**Pay  
in kind**

**Definition:** *The concept of earnings, as applied in wages statistics, relates to remuneration in cash and in kind paid to employees, as a rule at regular intervals, for time worked or work done together with remuneration for time not worked, such as for annual vacation, other paid leave or holidays.*

- Earnings exclude: employers' contributions in respect of their employees paid to social security and pension schemes and also the benefits received by employees under these schemes. Earnings also exclude severance and termination pay.

(For more information, see the Resolution concerning an integrated system of wages statistics, adopted by the Twelfth International Conference of Labour Statisticians); web link:

[http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_087496.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087496.pdf)

- Concept of earnings (§ 8,9)
  - Remuneration paid by employers directly to their employees
  - In cash and in kind
  - In exchange of time worked or work done
    - Includes remuneration for time not worked
    - Excludes employers' social security contributions and benefits from these schemes
    - Excludes severance and termination pay
  - Gross remuneration
    - Before any deductions by the employer on behalf of the employee to a compulsory social security scheme or for income tax deductions



## Definition of earnings: Components (§ 10)

- **Basic pay**
  - Pay for time worked or work done
    - Straight-time pay of time-rated workers
    - Earnings of pieceworkers (excluding overtime premiums)
  - Remuneration for time not worked
    - Public holidays
    - Annual vacations
    - Other time off with pay granted by the employer
- **Allowances**
  - Geographical and zone differentials
  - Cost of living allowances
  - Payments under guaranteed wage systems
  - Other regular allowances
- Bonuses and gratuities
  - Incentive pay of time-rated workers
  - Premium pay for overtime, shift, night and holiday work
  - Commissions paid to sales and other personnel
  - Seniority and special skills
  - Responsibility premiums
  - Dirt, danger and discomfort allowances
  - Seasonal and end-of-year bonuses
  - Additional payments in respect of vacation period (supplementary to normal pay)
  - Profit sharing bonuses
- Social security benefits
  - Housing and family allowances paid directly by the employer (social security benefit)

21

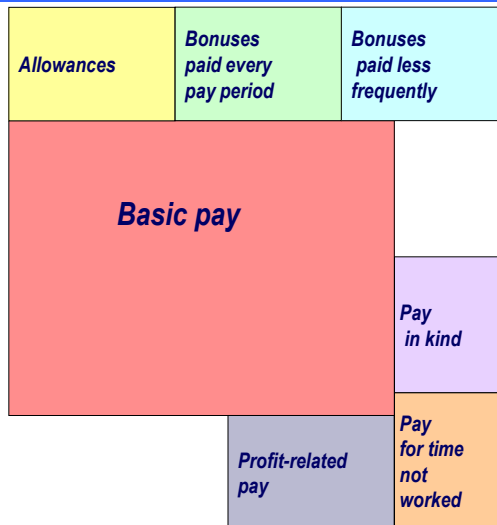


Statistics

## Earnings

Adopted by the  
12<sup>th</sup> ICLS in 1973

Relates to pay  
which is regularly  
provided by  
employers to  
employees





## Definitions

### Types of earnings

- **Gross earnings - international definition**
  - Before any deductions made by employers on behalf of employees
  - Standard measure of earnings
- Net earnings (no international definition)
  - Disposable income or take-home pay
  - After compulsory deductions by employers (for income and other tax, employees' contributions to compulsory social security and pensions schemes)
- Real earnings (of gross or net earnings)
  - Spending power of earnings
  - The amount of goods and services which can be purchased – comparable in time
  - Net earnings divided by consumer price index or similar indicator.

23



## Labour cost, 11<sup>th</sup> ICLS, 1966

**Definition:** Labour cost is the actual cost incurred by the employer in the employment of labour.

- Expressed as labour cost per hour worked
- Criterion for inclusion of an item as labour cost: benefit character to the worker as compared to the production process
- Worker coverage: all employees excluding managerial staff remunerated predominantly by a share of profits
- Taxes imposed on employment or payrolls: in countries where these are considered as labour cost, should be identified separately (net basis)

For more information, please see the Resolution concerning statistics of labour cost, adopted by the Eleventh International Conference of Labour Statisticians (October 1966); web link:  
[http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS\\_087500/lang-en/index.htm](http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_087500/lang-en/index.htm)

24

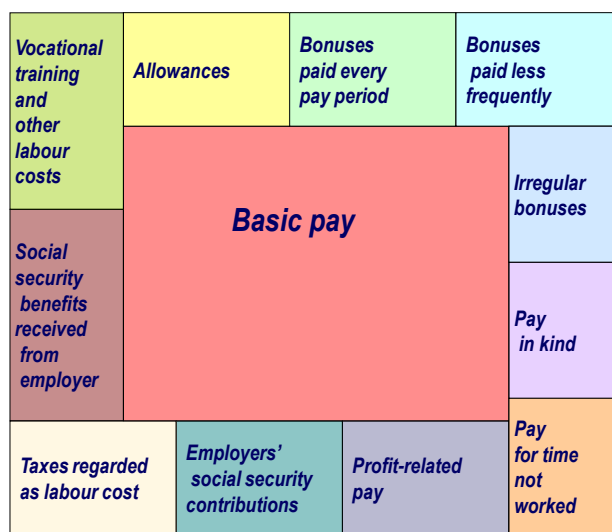
**Labour cost is the cost to the employer of employing employees related to:**

1. Direct wages and salaries
2. Remuneration for time not worked
3. Bonuses and gratuities
4. Food, drink, fuel and other payments in kind
5. Cost of workers' housing borne by employers
6. Employers' social security expenditure
7. Cost of vocational training
8. Cost of welfare services
9. Labour cost not elsewhere classified
10. Taxes regarded as labour cost (e.g. taxes on employment or payrolls)

## Labour Cost

*Adopted by the  
12<sup>th</sup> ICLS in 1966*

*Relates to the  
cost incurred by  
the employer in  
the employment  
of labour*



## Derived variables related to earnings and an integrated system of wages statistics



## Earnings: Derived variables and indicators

- Derived variables
  - Net earnings
  - Real earnings
- Averages of earnings
  - Per month, week, day, hour
  - By sex
  - By full time/part-time employment
- Medians of earnings
  - Per month, week, day, hour
- Quantiles



## Earnings: Derived variables

### Net earnings

- Gross earnings

MINUS

- Contributions of the employee to a compulsory social security scheme
  - Private or public
  - Usually the employer deducts this contribution from the pay check
- Advance payment of income tax
  - Most countries require that tax be paid on earnings, when earnings are above a certain threshold
  - Usually, this tax should be paid in advance to the end of the year
  - Usually, the employer deducts the estimated tax amounts from the pay check

29



## Earnings: Derived variables

### Real earnings

- Gross (= nominal) earnings
  - Do not indicate the capacity of workers to consume goods and services (purchasing power)
  - Do not indicate whether persons can buy more or less than before
- Real earnings
  - Also known as earnings adjusted for inflation, earnings in terms of prices of a specific year, earnings at constant prices
  - Take into account increases or decreases in the consumer price levels
  - Indicate whether increases in earnings result in increases or decreases in purchasing power
    - If earnings increase more slowly than the prices of goods and services (= inflation), real earnings decrease
  - Are always calculated with respect to another (base) period, e.g.,
    - What is the amount of goods and services that a person can buy today compared to what s(he) could have bought during the base period.

30

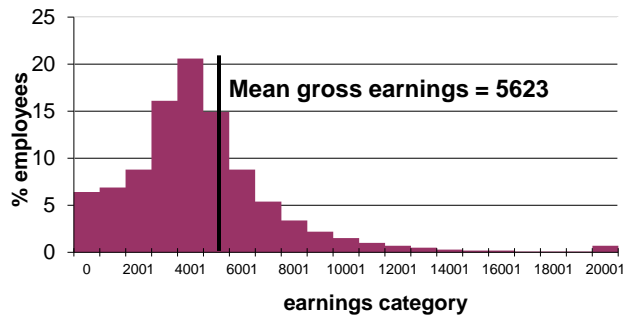


## Earnings: Derived variables

Means are commonly used

Because earnings follow a **skewed distribution**, the mean is influenced by the few employees with high earnings

**Distribution of employees by gross monthly earnings (%)  
Switzerland, 2006**



31

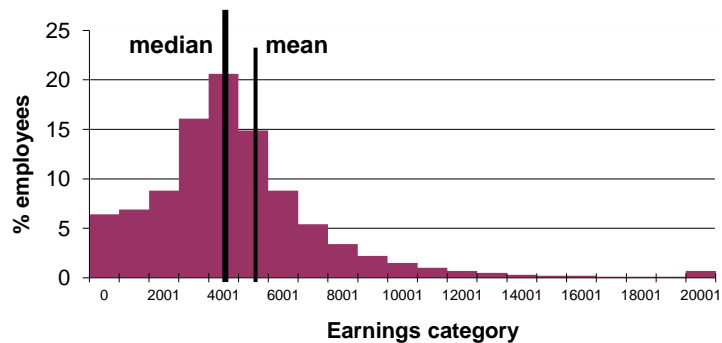


## Earnings: Derived variables

Medians

- The median is the value separating the higher half of a population from the lower half
- Is found by arranging all the observations from lowest value to highest value, cumulating them and picking the value of middle observation

**Distribution of employees by gross monthly earnings  
Switzerland, 2006**



32





## Earnings: Derived variables

### Quantiles

**Quantiles** are points taken at regular intervals from the cumulative distribution function of a random variable (income)

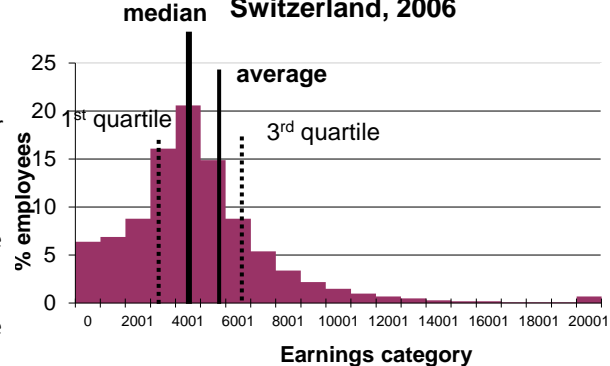
**Deciles:** any of the 9 values that divide the sorted data into 10 equal parts, so that each part represents 1/10th of the sample or population

- 1st income decile: the value below which are the 10% of persons with the lowest income
- 9th income decile: the value below which are the 90% of persons with the lowest income

**Quartiles:** divide the population in quarters

**Quintiles:** divide the population in five parts

**Distribution of employees by gross monthly earnings**  
**Switzerland, 2006**

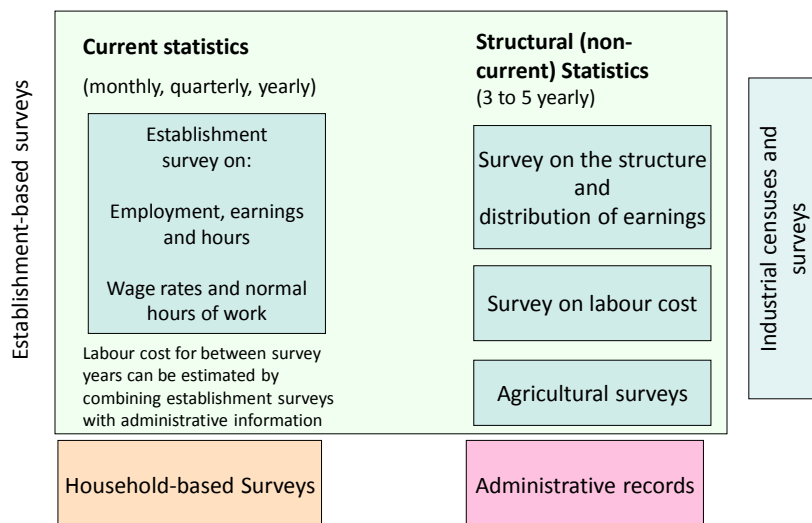


33



## Measuring earnings:

An integrated system of wages statistics (12<sup>th</sup> ICLS, 1973)



34



## References

- International Labour Office, 1979. *An Integrated System of Wages Statistics: A Manual on Methods*, Geneva
- Mata Greenwood, Adriana, 2008. Power point presentation: "Wages Statistics: An Introduction". ILO Bureau of Statistics. Geneva.
- Mata Greenwood, Adriana, 2014. Power point presentation: "Producing statistics on earnings". ILO Department of Statistics. Geneva.
- See also:
  - *Resolution concerning statistics of labour cost*, adopted by the Eleventh International Conference of Labour Statisticians (October 1966); web link:  
[http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_087500.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087500.pdf)
  - *Resolution concerning an integrated system of wages statistics*, adopted by the Twelfth International Conference of Labour Statisticians (October 1973); web link:  
[http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_087496.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087496.pdf)
  - *Resolution concerning the measurement of employment-related income*, adopted by the Sixteenth International Conference of Labour Statisticians (October 1998); web link:  
[http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_087490.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087490.pdf)
  - UN-System of National Accounts 2008 (definition of an enterprise, establishment); web link:  
<http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>