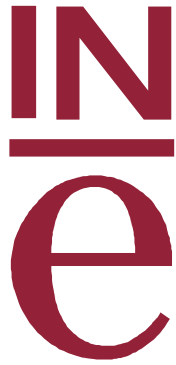


INSTITUTO NACIONAL DE ESTADISTICA



# Quarterly Labour Cost Survey

Methodology

Madrid, June 2023

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## 1 Introduction

The *Quarterly Labour Cost Survey* (herein, *QLCS*) is the fundamental source of information for the compilation of the *Harmonised Labour Cost Index (HLCI)*. The HLCI is part of the Euroindicators that the Statistical Office of the European Communities (Eurostat), under the auspices of the European Central Bank (ECB), requires of the Member States of the European Union, so as to analyse, once the nominal convergence has been contrasted, whether the convergence in real terms is being produced between these countries, and in particular, whether there is a tendency for labour costs per working unit to converge in Europe.

In addition, the QLCS provides levels and indicators regarding wage costs, as it has done traditionally with the Survey on Wages in Industry and Services since 1963, on labour costs and time worked and not worked.

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## 2 Objectives

The LCI is a continuous quarterly statistical operation whose main objective is to ascertain the evolution of the average labour cost by employee and by effective hour worked.

The LCI tries to provide:

- Average labour cost by employee and month.
- Average labour cost per effective hour worked.
- Time worked and not worked.
- The number of existing vacancies.

National and Autonomous Community results are obtained.

The LCI facilitates:

- Wage information, as the Wage Survey has traditionally done, but of better quality due to the methodological improvements added to the project.
- It also provides information on non-wage expenses with the aim of complying with the European requirements on this subject.
- Better information on the time worked and not worked, of its structure, as well as of its short-term evolution.
- Information regarding the unmet demand for labour from the number of vacancies.

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### **3 Scope, coverage and reference period**

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#### **3.1 POPULATION SCOPE**

This comprises all of the Contribution Accounts, regardless of their size, included in the General Scheme, and whose economic activity is in Sections B to S of CNAE-90 and in the Special Scheme for Sea Workers and whose economic activity is sea transport (division 50 of CNAE-09).

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#### **3.2 POPULATION GROUP**

Within each account, all employees who work for others, for whom a contribution was required for at least one day during the reference month independently of their contract type or working day, and who are associated with the account, are investigated in a grouped manner.

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#### **3.3 GEOGRAPHICAL SCOPE**

The geographic scope covers the whole of national territory, with results broken down by Autonomous Communities. The information corresponding to Ceuta and Melilla is provided together with that of Andalucía.

The survey is not designed to provide reliable information within a provincial scope nor, therefore, in territorial scopes smaller than the province.

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#### **3.4 COVERAGE BY SECTORS**

This researches the contribution accounts whose economic activity is included in the three large economic sectors: Industry, Construction y Services, and specifically, those centres with economic activities listed in sections B to S of CNAE-09:

<b>CNAE-09</b>	<b>Economic Activity</b>
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities

The maximum breakdown level of economic activity is the NCEA-09 division. Specifically, 82 activity divisions are analysed.

The following sections are excluded: Agricultura, forestry and fishing (A), Activities of households as employers (T) and Activities of extraterritorial organisations and bodies (U).

### 3.5 REFERENCE PERIOD

Given that the quarterly evolution of monthly labour costs by work unit is intended to be investigated, the following are distinguished:

- The reference period for the results is the calendar quarter.
- The reference period for the information requested on the questionnaire is the calendar month.

## 4 Definitions

### 4.1 WORKERS

All persons tied to the producing unit by means of a work contract, independently of the type of said contract, are defined as workers.

The *employees who are the object of the survey* are all those associated to the contribution account for whom there has been a contribution required for at least one day of the reference month.

For the purposes of the labour costs calculation by worker, those that have been registered in the contribution account during a period of less than a month are accounted for in proportion to the time that they have been registered in said account.

Employees are classified according to the type of working day by:

**Full Time Workers** - Are those persons who work a normal company working day in the activity involved.

**Part Time Workers:** Are those persons who work a shorter than usual or normal working day for a full time worker in the activity involved.

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## 4.2 TIME WORKED AND TIME NOT WORKED

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### 4.2.1 Hours worked

**Effective hours:** Are the hours actually worked both in normal work as well as in overtime work periods, including those hours lost in the workplace, which are considered as effective time by virtue of the regulations in force.

They are obtained as the sum of the agreed hours plus the overtime and/or complementary hours minus the hours not worked, from which are excluded those hours lost in the workplace since they are considered as effective time. In summary, it involves the hours worked (in a normal or overtime working day) minus the hours not worked.

**Agreed working day.** Are the hours legally established by verbal agreement, individual contract or collective agreement between the employee and the company.

**Overtime hours:** Are all those that are carried out outside the agreed working day, be they by acts of god (*structural overtime hours*) or voluntary (*non-structural overtime hours*).

**Complementary hours:** Are the hours agreed in the part time contract as an addition to the normal or usual hours. They are paid and contribute the same as ordinary hours.

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### 4.2.2 Hours not worked

#### **Hours not worked and not remunerated**

Hours not worked are included by the following causes:

- Vacations and holidays taken during the month.
- Days missed due to temporary disability.
- Maternity, adoption and personal leave days.
- Leave as compensation for overtime hours.
- Union representation hours, fulfillment of an unavoidable duty, attendance at exams and medical visits, among other concepts
- Days or hours not worked for technical, organisational or for production reasons: they are temporary suspensions in the rendering of the service or in the production of goods by the employee (suspended days) or reductions of the work day (reduction hours) with the aim of overcoming crisis situations in the company.
- *Hours lost in the workplace*: they are hours not worked due to reasons not attributable to the employee or the business person such as occasional lack of work, breakdown in machines, lack of raw materials, atmospheric accidents, power cuts or other causes of acts of god. The law allows the recovery of these non worked lost hours at a rate of one hour per day, with previous notification and if there is no agreement to the contrary. This component only covers the hours that have not been recovered and, therefore, can be considered as truly not worked.

#### **Hours not worked and not remunerated.**

Included are the following:

- *Labour conflicts*: Is the total number of hours lost due to strikes independently of the local, sectorial, or corporate scope, or the total or partial intensity of the same. Time recovered later is not accounted for.
- Absenteeism; legal custody; management lockout, ... .

In the case of *management lockout* the business person closes the work centre due to a collective conflict, with the danger of violence or damages, illegal occupation of the centre or the existence of irregularities that impede the normal production process.

*Legal custody* is a reduction of the work day for those employees that request it because they have under their direct care a child under 6, or a physically or psychologically challenged person who does not work.

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### 4.3 LABOUR COSTS

Labour cost is defined as the total cost incurred by employer by using the work factor.

The labour cost is analysed from two perspectives:

- Labour cost by unit of work: Labour cost by worker and month.

Measures the expense that a business person undertakes when employing an employee during one month.

- Labour cost by unit of time: Labour cost by effective hours of work.

Measures the expense that a business person undertakes for one effective hour of work.

The cost must be measured in net terms for the employer, in other words, deducting the various subsidies received.

The labour cost comprises a wide range of entries that the survey covers in two main blocks: The cost of wages and other costs.

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#### 4.3.1 Wage Cost

Comprises all remunerations, both in cash and in kind, made to workers for the performance of their work services for others, whether it rewards effective work, whatever the method of remuneration, or the rest periods accounted for as work.

Wages include: the Base Wages, Wage Complements, Overtime and/or Complementary Payments, Bonuses and Wage in Kind.

***The Overtime and/or Complementary wage payments:*** correspond to payments for overtime hours, both structural (by acts of god) as well as non-structural (voluntary) and to payments for complementary hours in the case of part time workers.

***Bonuses:*** is remuneration that is received in periods which are greater than one month: bonuses, payments for participating in profits, premiums, objectives and any other exceptional payments.

***Delayed Payments:*** are payments paid in the reference month but earned in previous periods.

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#### 4.3.2 Other Costs

The other costs include non-wage amounts and the obligatory contributions to social security.

##### **Non-wage payments**

Are remuneration received by the worker not for their work activity, but rather as compensation for expenses occasioned in the rendering of their work or to cover needs or situations of inactivity not attributable to the worker.

Amongst these, the survey differentiates between:



### **Direct corporate contributions.**

Payments made by the company directly to the worker, the former worker or their family to assist them under certain circumstances as a complement of certain social services, without implicating Social Security or other insurance companies. Their main characteristic is that we are dealing with benefit payments for well-being.

Distinction is made between:

***Temporary Disability Payments:*** Payments that the company makes directly to workers who are in a TD situation. Includes Delegated Payments<sup>1</sup> for TD, payments for TD undertaken exclusively by the company (the first fifteen days) and voluntary supplements or improvements to the TD benefit.

***Unemployment Payments:*** Payments made by the company to workers affected by temporary suspension or work day reduction in the event of work regulation during the reference month. They include Delegated Payments for partial unemployment, as well as voluntary improvements for partial unemployment paid for by the company with the object of complementing unemployment benefits.

***Payments for Other Direct Services:*** Payments that the company makes directly to the active workers and/or former workers and/or their family members, as a complement to social security or private insurance subsidies or pensions. They include payments for retirement, payments for death and survival, payments for disability or handicap, payments for medical assistance and payments for family assistance.

***Indemnities for Dismissal:*** Include the total payments made for dismissal and contract termination, as well as the wages not received during the transcourse of the dismissal proceedings that the employer must pay in this situation (dismissal proceedings wages). Both indemnities for individual dismissals as well as indemnities for group dismissals are considered here. That paid under pending obligations, such as wages owed, vacations not taken, ... (compensations) are excluded, since these amounts are considered delayed payments.

### **Other non salary payments**

Encompass the rest of payments made to the worker: compensation for the expenses derived from the execution of their work and indemnities for contract termination.

They comprise: Currency devaluation, wear and tear of tools, acquisition of work clothes, travel expenses, distance and urban transport allowance, relocation indemnities, contract termination indemnities, products in kind conceded

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<sup>1</sup> Delegated payments: Benefits given as Delegated Payments are those which, previously recognised by the competent managing unit, is paid by the business person and subsequently compensated upon liquidation of the Social Security quotas, which in this manner assumes responsibility for same.

voluntarily by the company whose delivery is not due by virtue of regulation, Group Agreement, or work contract, the delivery of products at reduced prices that are carried out in company canteens or dining rooms or corporate cooperative stores.

### **Obligatory contributions to Social Security**

These are the legally established contributions that the employer makes to the Social Security System in favour of their employees to cover the services the system establishes, and which are those derived from illness, maternity, work accident, disability, retirement, family, survival, unemployment, professional training, wage guarantee, or any other contingency covered by the Social Security System.

The entries that comprise these obligatory contributions are:

#### **General contributions**

*Common contingencies:* Are contributions that cover services for common illness and non-work accident, maternity, disability, death, survival (if these last three contingencies have been the result of a common illness or non-work accident) and retirement.

*Overtime hours contributions:* Are contributions for this concept, both for structural overtime (or due to causes of acts of god) as for non-structural overtime (or voluntary) hours.

*Common Service Contributions:* Contributions of the companies that collaborate in the TD contingency management for work accident and professional illness.

*Workers with Training / work experience contracts:* These contributions cover the common contingencies for employees with training or work experience (if they exist) contracts, because to these workers the type of contribution applied for quota calculation is different to that of the remaining workers.

*Other concepts:* Refers to other contribution concepts different to those already indicated which, not having a specific form for effecting payment, its payment has been authorised in the TC-1.

*Deductions for excluded contingencies:* These deductions are solely used by the companies that have them granted.

*Deductions for voluntary collaboration in common illnesses / non work accidents:* Reductions applied to those companies that are authorised to voluntarily collaborate in the management of the Health Services and TD, derived from common illness or non work accident.

*Temporary Disability (TD):* Economic services, in delegated payment regime, for Temporary Disability (TD), derived from common illness or non-work accident.

#### **Contributions for work accidents and professional diseases**

*TD Quotas:* Quotas for Temporary Disability derived from work-related accidents and/or illnesses.

*DDS Quotas:* Quotas for Disability (permanent disability), death and/or survival derived from work accident and/or work-related illness.

*Compensation for TD derived from work-related accidents and illnesses:* economic services, in delegated payment regime, for Temporary Disability (TD), derived from work-related illness and/or accident .

### **Other contributions**

*Unemployment, Wage Guarantee Fund (WAGUFU) and Professional Training:* Determine the contribution concepts whose object it is to cover this type of contingencies.

*Compensation for partial unemployment:* Are the amounts that the companies have given their workers under the concept of partial unemployment services, as a delegated payment.

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#### 4.4 SUBSIDIES

Reductions, bonuses and subsidies that employers apply in the liquidation of Social Security contributions, motivated by the contracting of determined groups of workers or by aid recognised by the unemployment office as part of its budget.

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#### 4.5 VACANCIES

A vacancy or job offer is understood to be that job post that either has been created recently, or is not occupied, or is about to become free, and for which, the businessperson is taking active measures for the purpose of finding an ideal candidate not related to the company.

Employment vacancies partially reflect the unmet demand for labour, as well as the possible imbalances between the capacity and the availability of unemployed persons and workers sought by employers.

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## 5 Indices and rates

The LCI is a simple index of labour cost variation.

To obtain it, we take the year 2020 as a base period, in such a way that the average cost in the year 2020 becomes 100.

A random *simple index* is calculated by means of the formula:

$$I_t = \frac{C_t}{C_0} \cdot 100$$

being:

$C_o = \frac{\sum_{t=I}^{IV} C_t^{2012}}{4}$  cost in the base period (2020), is the average cost in the year 2020

$C_t$  cost in the current quarter (t)

The Inter-annual labour cost variation rates are calculated in this form:

$$r_t = \frac{I_t - I_{t-4}}{I_{t-4}} \cdot 100$$

where,

$I_{t-4}$  value of index for the same quarter of the previous year

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## 6 Survey design

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### 6.1 STATISTICAL UNIT AND POPULATION FRAMEWORK

The **statistical unit** of the LCI is the *Social Security Contribution Account*, a concept traditionally used in wage and labour cost surveys, both by the INE as well as by other organisms with competence in this matter.

The stratification criterion is made, based on three variables: the Autonomous Community (17 in total, considering Ceuta and Melilla together with Andalucía), economic activity CNAE-09 division, 82 divisions in total) and unit size (8 strata or size groups).

The **population scope** used to extract the sample is the Social Security Contribution Accounts Directory, updated to 30 September of the year prior to the reference year.

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### 6.2 STRATIFICATION AND SAMPLING ALLOCATION

The **sample type** used is a random stratified sample with optimum allocation, in which the sample units are the contribution accounts.

The stratification criteria is carried out attending to three variables: the Autonomous Community (17 in total, considering Ceuta and Melilla together with Andalucía), the economic activity (CNAE-93 division, 54 divisions in total) and the size of the units (8 strata or size groups).

The unit size is defined by the number of employees covered.

The following groups are considered for the stratification:

Stratum	Number employees
1	1-4
2	5-9
3	10-19
4	20-49
5	50-99
6	100-199
7	200-499
8	500 y más

The first time the survey is conducted, the sample size is calculated by applying the optimal allocation. Afterwards, additions and deletions are made in an attempt to maintain the initial sample size..

The optimal allocation applied to the QLCS consists of calculating the minimum sample size  $n$ , subject to the stratified estimator of expansion of the total number of workers  $\hat{X}$  not exceeding the following relative sampling errors or pre-specified coefficients of variation:

- 2% by activity división at national level
- Between 3 and el 5% by sector of activity (industry, construction, services), at the autonomous community level.

### 6.3 SAMPLE SIZES AND ROTATION SHIFTS

The contribution accounts of size group 8 (500 and more employees) are investigated exhaustively, all of which are included in the sample. In the remaining groups, a systematic sample with random start is obtained.

The sample is made up of 28,000 units that are interviewed each quarter.

This sample is divided into three monthly sub-samples during the quarter, in such a way that the first sub-sample will be interviewed the first month of each quarter, the second sub-sample will be interviewed the second month of each quarter and the third sub-sample will be interviewed the last month of each quarter. In this way, each sub-sample is interviewed four times a year, and each month about 9,350 units are interviewed.

The sample distribution by Autonomous Communities and sizes is the following:

Autonomous Communities	Sizes								
	Total	1	2	3	4	5	6	7	8
TOTAL	28.099	7.278	3.584	3.485	4.081	2.672	2.119	2.795	2.085
Andalucía	2.617	781	277	276	366	229	188	266	234
Aragón	1.322	330	183	173	190	148	104	133	61
Asturias (Principado de)	1.146	290	178	169	176	116	94	77	46
Balears (Illes)	1.181	324	172	173	181	117	82	77	55
Canarias	1.409	378	192	180	204	139	120	122	74
Cantabria	974	250	164	157	153	93	64	72	21
Castilla y León	1.496	401	199	192	204	141	120	155	84
Castilla-La Mancha	1.333	348	197	185	199	131	98	115	60
Cataluña	3.545	890	350	354	506	306	267	467	405
Comunidad Valenciana	2.242	632	265	267	331	213	159	221	154
Extremadura	1.067	288	193	172	162	104	67	49	32
Galicia	1.608	446	209	198	221	161	135	151	87
Madrid (Comunidad de)	3.351	721	282	294	435	286	274	512	547
Murcia (Región de)	1.245	336	192	178	194	128	83	83	51
Navarra (Comunidad Foral de)	1.049	237	172	170	166	111	77	82	34
País Vasco	1.660	396	199	197	238	172	141	185	132
Rioja (La)	854	230	160	150	155	77	46	28	8

The sampling distribution by CNAE-09 division and size is as follows:

CNAE09 Divisions	Sizes								
	Total	1	2	3	4	5	6	7	8
TOTAL	28,099	7,278	3,584	3,485	4,081	2,672	2,119	2,795	2,085
05	53	10	7	7	10	5	9	2	3
06	8	6	1	1	-	-	-	-	-
07	56	24	13	4	11	-	3	1	-
08	200	46	38	39	43	23	8	2	1
09	46	19	10	8	5	2	1	-	1
10	465	80	55	44	59	42	48	99	38
11	254	42	34	37	50	35	23	26	7
12	31	8	3	3	3	4	3	5	2
13	257	53	41	47	50	29	17	19	1
14	268	54	48	43	47	31	21	16	8
15	223	58	37	43	42	28	12	2	1
16	289	82	42	44	49	34	19	15	4
17	241	43	34	31	32	28	27	42	4
18	325	84	48	49	69	33	25	14	3
19	83	20	13	12	14	6	5	4	9
20	305	41	34	39	48	39	30	61	13
21	226	39	33	28	23	17	22	49	15
22	277	45	34	39	36	35	26	50	12
23	317	50	40	42	48	36	32	55	14
24	296	43	36	37	36	32	27	59	26
25	355	81	52	44	51	39	35	43	10
26	296	84	51	39	44	26	24	19	9
27	277	43	36	39	46	27	35	38	13
28	322	51	45	43	66	36	35	39	7
29	313	40	34	33	35	29	28	79	35
30	228	34	34	32	33	25	19	33	18
31	361	87	49	57	85	42	21	17	3
32	296	90	49	53	57	23	12	9	3
33	335	70	45	50	67	35	27	32	9
35	241	41	36	34	36	27	22	31	14
36	241	44	33	34	40	27	25	33	5
37	116	30	22	27	20	10	4	2	1
38	356	62	54	55	55	40	32	39	19
39	42	17	10	5	7	2	1	-	-
41	1,438	473	218	217	232	141	96	50	11
42	472	148	58	58	84	48	37	34	5
43	1,050	281	170	173	167	111	81	48	19
45	439	122	59	65	89	54	29	19	2
46	575	168	71	63	70	51	48	73	31
47	1,024	354	79	61	65	48	55	168	194
49	460	150	53	44	45	37	35	59	37
50	126	40	22	21	24	10	6	2	1
51	150	28	22	20	22	16	10	16	16
52	382	69	44	44	55	39	38	66	27
53	217	36	35	34	32	17	13	21	29
55	355	43	35	36	67	54	50	47	23
56	572	242	62	52	47	38	32	54	45
58	304	49	36	40	51	38	40	41	9
59	323	70	44	54	82	33	29	9	2
60	198	35	35	42	37	18	9	12	10
61	229	38	33	30	29	24	21	34	20
62	315	51	38	39	51	38	34	37	27
63	166	65	34	25	22	10	6	3	1
64	428	37	35	36	36	35	37	97	115
65	270	50	35	36	42	29	28	27	23

CNAE09 Divisions	Sizes								
	Total	1	2	3	4	5	6	7	8
66	420	226	50	45	48	26	10	15	-
68	556	343	64	49	53	26	17	4	-
69	454	178	68	55	61	31	22	24	15
70	341	125	45	45	54	22	20	17	13
71	402	111	46	46	67	43	33	34	22
72	282	38	45	39	53	45	20	30	12
73	341	82	47	50	63	40	23	31	5
74	422	229	57	54	48	19	10	4	1
75	352	234	59	30	20	5	3	-	1
77	321	108	44	43	45	35	19	23	4
78	312	34	34	32	34	35	37	60	46
79	302	90	40	43	55	32	19	15	8
80	284	34	32	34	37	35	33	47	32
81	448	35	35	37	39	35	44	102	121
82	418	75	42	40	57	41	39	53	71
84	669	53	38	39	51	57	68	114	249
85	545	80	50	43	70	46	41	75	140
86	693	76	36	35	34	36	39	115	322
87	311	33	34	40	68	48	35	36	17
88	323	37	34	35	46	42	41	52	36
90	283	91	46	41	47	32	18	8	-
91	194	49	32	35	37	26	10	5	-
92	318	103	35	39	72	34	18	13	4
93	380	103	43	51	86	45	30	19	3
94	376	122	48	51	57	37	27	29	5
95	352	145	52	55	61	26	7	4	2
96	508	274	59	47	52	37	24	14	1

The total sample is divided into five rotation groups in such a way that in the first quarter of each year the oldest group is replaced, which implies a renewal of 20% of the sample.

An exception should be made of the exhaustive units (units with more than 500 workers and those belonging to strata so small that their sample size necessarily coincides with the population), which due to their exhaustive character do not give rise to any renewal whatsoever and, except for termination, should continuously remain in the sample. These units make up 28% of the sample.

## 6.4 ESTIMATORS

### 6.4.1 Estimator of the total of one characteristic X

Separate ratio estimators *are used, using the number of workers in the Social Security Contribution Accounts Directory as an auxiliary variable.*

The separate ratio estimator for the total of X is given by the expression:

$$\hat{X}_R = \sum_h \hat{X}_{Rh}$$



Where

$$\hat{X}_{Rh} = \hat{R}_h D_h = \frac{\sum_{i=1}^{n_h} X_{hi}}{\sum_{i=1}^{n_h} D_{hi}} D_h = \frac{\sum_{i=1}^{n_h} X_{hi}}{d_h} D_h$$

Being,

$h$ : stratum defined by the crossing of the branch of activity, Autonomous Community and size variables.

$N_h$ : population size for the stratum  $h$ .

$n_h$ : sample size for stratum  $h$ .

$X_{hi}$ : value of variable  $X$  in unit  $i$  of stratum  $h$ .

$D_{hi}$ : number of workers, according to the directory, in unit  $i$  of stratum  $h$

$D_h = \sum_{i=1}^{N_h} D_{hi}$  : total workers, according to the directory, in directory centres belonging to stratum  $h$ .

$d_h = \sum_{i=1}^{n_h} D_{hi}$  : total workers, according to the directory, in centres of the sample selected within stratum  $h$ .

Grouping the terms that accompany each value  $X_{hi}$ , observing in a stratum  $h$ , that the factor of elevation within each stratum  $h$  is:

$$F_h = \frac{D_h}{d_h}$$

#### 6.4.2 Estimates of the cost per worker and month and of the cost per effective hour

To estimate the labor cost per worker in a domain  $G$ ,  $\hat{C}_G$ , the following expression is used:

$$\hat{C}_G = \frac{\sum_{h \in G} \hat{X}_{Rh}}{\sum_{h \in G} \hat{Y}_{Rh}}$$

where,

$\hat{X}_{Rh}$ : the separate ratio estimator for the labour cost.

$\hat{Y}_{Rh}$ : the separate ratio estimator for the total number of workers.

The estimator of the cost per hour worked is made in a similar way to the previous case, substituting the estimator of the total number of workers for that of hours worked.

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### 6.4.3 Sampling errors

The relative sampling errors or coefficients of variation, in percentage, are published for the main variables: Total labor cost, Wage cost and Other costs, by activity division and by autonomous community. This sampling error, in percentage, for a given domain G, is calculated as follows:

$$\widehat{CV}(\hat{X}_G) = \frac{\sqrt{\widehat{V}(\hat{X}_G)}}{\hat{X}_G} \times 100$$

Being a separate ratio estimator, the linearization technique, which is based on Taylor's development, is used to approximate the nonlinear ratio estimator to a linear expression and apply the usual techniques for calculating the variance of a linear estimator. Therefore, the sampling error that is calculated is an approximation of the true error and is given by the following formula:

$$\widehat{V}(\hat{X}_G) = \sum_{h \in G} \widehat{V}(\hat{X}_{Rh}) = \sum_{h \in G} N_h^2 (1 - f_h) \frac{S_{he}^2}{n_h}$$

Being,

$$S_{he}^2 = \frac{\sum_{i=1}^{n_h} (X_{hi} - \hat{R}_n D_{hi})^2}{n_h - 1} \quad f_h = \frac{n_h}{N_h}$$

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## 7 Collection and treatment of the information

The questionnaires are sent by post from the INE's provincial delegations and collected by them, where they are submitted to recording and a first filtering. In the Central Services a second filtering and treatment of the data is carried out. Once the consistency of the information is assured, the tables and series of results are obtained.

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## 8 Calculation of cost per hour of overtime

Overtime hours can be remunerated with cash or with remunerated rest hours.

Paid hours are defined as, (making abstraction of full time and part time), the effective hours plus the non worked and remunerated hours, or as the agreed hours plus the overtime hours less the non worked and non remunerated hours:

$$PH = AH + OT - NWNRH = AH - NWNRH + OT$$

Where,

PH Paid hours

AH Agreed hours

OT Overtime

NWNRH Non-worked and non-remunerated hours

Rest hours as compensation for overtime hours are paid hours, which have a cost that we wish to discover.

Total (net) labour costs is defined by:

$$NTLC=W+OW+NWP-SUB=(W-OW)+OW+OC-OHCO+OHCO+NWP-SUB=$$

$$=W-OTW + OC-OHCO+NWP -SUB + OTW+OHCO$$

↓	↓	↓
Salary minus overtime	Other costs minus overtime	Direct cost per extra hour

Where,

NTC net total labour cost

S Wages

OTW Overtime wage

OC Obligatory contributions

OHCO Overtime hour contribution

NWP Non-wage payments

SUB Subsidies

The total cost of hours paid except overtime hours is called the *ordinary* hours cost (TCOH):

$$TCOH=S-OW + OC-OHCO+NWP-SUB$$

If we define ordinary hours paid (OH) as  $OH = AH-NNRH$

The cost of an ordinary hour would be  $COH=TCOH/OH$

And thus, the cost of *compensated* hours will be  $HO \times COH$

Where, HO hours off as compensation for overtime hours.

If one overtime hour can be paid with money or hours off or a mixture of the two, the cost for the business person will be:

$$COT=OW+OHCO+HO \times COH$$

and the cost by extra hour:

$$HCOT= (OTW+OHCO+HO \times COH)/OT$$

The total cost parting from these results will be equal to the cost of ordinary hours except the *compensated* hours plus the cost of overtime hours:

$$CNT= COH \times (AH-NNRH-HO)+COT$$

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## 9 Description of published variables

**Total cost::** includes the wages cost plus other costs.

**Other costs:** non-wage payments plus obligatory contributions minus social security subsidies and bonuses.

**Total wage cost:** this includes ordinary wage costs, extraordinary payments and delayed payments.

- **Ordinary wage cost:** are the monthly wage payments.
- **Extraordinary payments wage cost:** includes extraordinary payments and any other payment whose due date is more than a month (except delays).
- **Delayed payments wage cost:** these are payments made over the month and earned in previous periods.

**Extraordinary wage cost:** is the wage cost for extraordinary payments plus the wage cost for delayed payments.

**Non-wage payments cost:** includes cost for T.D. (temporary disability), for unemployment, other direct corporate benefits, compensation, dismissal and non-wage payments.

- I.T. cost: payments for I.T. at the employer's expense.
- Unemployment cost: payments for unemployment (reduction of working day and/or suspension of contract) at the cost of the employer.
- Cost for other direct corporate benefits: includes direct corporate benefits complementary to social security paid for by the employer.
- Cost for other non-wage payments: includes the rest of non-wage payments.

**Cost for obligatory contributions:** cost of obligatory social security paid for by the employer.

- Cost for common contingencies: contributions for common contingencies from obligatory social security paid for by the employer.
- Cost for unemployment, Fogasa and professional training: contributions paid for by the employer who covers these contingencies.
- Cost for other obligatory corporate contributions: this includes the rest of obligatory social security contributions

**Social security subsidies and bonuses:** reductions, bonuses and subsidies in social security liquidations.

**Cost for dismissal:** payments made as compensation for dismissal and extinction of contract.

**Payments per day of T.D.:**T.D. payments paid for by the employer per day when the employee comes off work for this contingency.

**Cost of compensation for dismissed employee:** this is the quotient of the total cost for dismissal among the total dismissed workers.

**Cost per extra hour:** overtime hours may be remunerated in cash or with remunerated rest hours. Cost per extra hour is the quotient between the sum of payments made for overtime hours plus the corresponding contributions for these hours plus the labour cost attributable to rest hours granted as compensation (see point 8 of the methodology) among the extra hours carried out.

**Agreed hours:** these are those legally established by employer/workers agreement (including that agreed for holidays and public holidays).

**Paid hours:** includes hours worked and not worked.

**Effective hours:** these are hours really worked including extraordinary hours. They are calculated as the hours agreed plus extraordinary hours minus hours not worked by different causes.

**Hours not worked:** this is the total of agreed hours not worked for some reason. Included are: not worked by holidays, not worked for public holidays (official and non-official), not worked by T.D. (temporary disability) not worked by maternity, adoption, paid leave (marriage, birth, death...), not worked for technical or economic reasons (with or without employment regulation file), other hours not worked and paid (union representation, medical visits...), not worked in the job post because of acts of god (power cuts, breakage of machines...), not worked due to labour conflict and finally not worked for other reasons (absenteeism, lockout, ...).

**Number of vacancies:** Number of vacancies during the reference quarter.

**Reasons why there are no vacancies:** percentage distribution of the reasons why the units do not have vacancies.