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Towards a Labour Price Index

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Introduction

Labour costs data derived from statistics such as the Quarterly Labour Cost Survey (QLCS) and the Labour Cost Index (LCI), obtained from information provided by the employers answering an aggregated questionnaire for all the employees working in the unit (local unit or enterprise), are average data. Regarding wages and salaries, the mentioned sources provide the average wage in each period.

The value of that average wage is affected not only by the remuneration of each employee but also by the composition of the employment, that is, by the number of employees who are at each moment in each occupational category, in each type of contract, etc. Thus, a variation from one period to another in the proportion of employees in each mentioned group, affects the average (for example, it may increase if the percentage of indefinite employees increases due to temporary employment destruction).

An analysis of wages evolution should discount this 'composition' effect, namely it should measure this evolution in equal quality and quantity conditions of employment in both periods of time. To this end, it is necessary to take into account additional elements apart from those provided by QLCS and LCI, related with the composition of employment.

The Labour Cost Index constitutes a first step in order to discount the composition effect, although is restricted to keep a fixed structure of the economic activity at industry level. To go beyond, we would have to calculate the so-called Labour Price Index (IPI). For that purpose, it is necessary to have individual information on the employees.

There is no standard international definition of Labour Price Index. In its most sophisticated form is able to evaluate changes in the hourly wage for a 'jobs basket'. This requires keeping track of the jobs included in the mentioned basket over time, usually on quarterly basis. The organisation of a survey that meets these aims would come at a very high cost, unaffordable in Spain today. Therefore, in order to reduce costs related to data collection, it was decided to conduct annual monitoring of a sample of

representative existing jobs in the economy by using the information provided by the annual and four-yearly Structure of Earnings Surveys.

These two surveys collect and provide individual information on over 200,000 employees, about their annual salaries and additional variables regarding the relation between the employee and his/her job that allows to establish relationships between wages and some variables (occupation, age or type of contract, among others) that may contribute to determine their amount. . However, a panel of common employees in all reference periods is not available, nor remain constant their jobs characteristics.

An alternative solution is to create strata of employees grouping those with similar characteristics and follow the average wage in each stratum instead of the salary of each employee individually. The joint evolution is calculated by weighting each strata. Concerning this, it is convenient to create small strata, since the more defined is the type of job, the better the adjustment for quality change and composition.

On the other hand, a minimum number of observations per stratum in each period is necessary to calculate a representative average wage for each stratum with traditional estimators. This requirement would force to decrease the degree of detail of each stratum by reducing the number of defining characteristics. As a result, employees belonging to the same stratum may not be as homogeneous as desirable. Therefore, hedonic regression models are used. These models enable the estimation of average wage per stratum, regardless of whether a large number of employees belonging to the same stratum in the period exists or not. Thus, the number of types considered and the degree of detail in their definition is higher, which significantly improve the fit.

The index construction is performed similarly to the calculation of the LCI, keeping fixed the composition of employment not only by section of economic activity, but also by size and region of the sample unit and sex, occupation, type of contract, age and seniority of the employee. The weights are obtained from the own survey for the base year.

The first preliminary results obtained are presented in this paper.

2. Information needed and used to build the index

The LPI should provide a measure of changes over time in the price paid for labour but it should not be affected by changes in the quality or quantity or work performed. i.e. by changes in the composition of the labour force, hours worked, or changes in characteristics of employees.

Like in the Consumer Price Index, the LPI is a Laspeyres-type index where the index numbers are compiled for a representative sample of employee jobs within a sample of employing units (establishments or local units).

Units are classified as usual: economic activity, region and size. Therefore, the most appropriate way of building the index is selecting in each unit (establishments or local units) a representative sample of jobs and in each selected job, a sample of employees.

To this aim, a business register of all local units in each region is needed with information on its economic activity and size in number of employees, in order to select the first stage of the survey: the sample of units. Moreover, it is necessary to know all the occupations performed in each selected unit to obtain the second stage: the occupations sample. Finally, a sample of employees in each occupation should be selected.

The information on each individual employee includes personal characteristics (sex, age, ..), job characteristics (occupation, full-time, part-time, type of employment contract, etc.), labour cost components and the related hours worked.

According to the Annual labour costs survey of 2013 in Spain, the main labor cost components are wages and salaries (73,4%). Statutory social-security contributions represents 22,4% and the remaining 4.2% are social benefits and other expenditure paid by the employer. The LPI should include all the labour cost components and obtain sub-index for each one.

Regarding the information on hours worked, it is required in order to measure the cost of a comparable volume of work done. There are two main concepts: hours paid versus hours actually worked. The last concept excludes hours paid but not actually worked such as annual leave, holidays and sickness leave, etc. Hours actually worked are preferred than hours paid but the complexity and difficulty to collect them individually make that, in many cases, only hours paid are available.

All this information is grouped forming elementary aggregates or cells. Each cell represents groups of jobs with the same territory, economic activity and occupation characteristics. The LPI is compiled for each cell and cells are aggregated using weights. The weights are a measure of the relative importance of each elementary aggregate, based on employers' expenditure on labour.

The Structure of Earnings Surveys have been the source of information chosen to calculate the LPI due to the main following reasons:

- They are an existing source of information
- Their informative richness: They provide data on individual employees, especially on the occupation variable, which is the central variable to this kind of analysis.
- Their sampling size allows to study the employees' characteristics in a deep way.
- Although there is not information on all labour cost components from these surveys, they provide the more important one: wages and salaries. Normal working hours are also available to obtain the indexes.

The Structure of Earnings Survey (SES) is a four-yearly statistical operation (since 2002), carried out in the framework of the European Union with common content and methodology criteria, intending to obtain results that are comparable on the basis of structure and wage distribution between Member States according to the Council Regulation 530/1999 and the Commission Regulation 1916/2000 as amended by Commission Regulation 1738/2005.

The main novelty presented by this survey compared with other earnings surveys consists of the capture of wages and salaries on an individual basis in the questionnaire and, alongside these, a large amount of variables related to the employee. Thanks to this, it is possible to establish links between salary and some variables that may help to determine its amount, as is the case of the educational level reached, length of service, type of contract or occupation, among others.

Beginning in the year 2004, and in those years when the four-yearly survey is not conducted, the Annual Structure of Earnings Survey (ASES) obtains estimates of the gross annual earnings per employee, classified by type of working day (full-time, part-time), gender, age, economic activity according to NACE-Rev 2 and occupations to one digit of ISCO.

The information is obtained through the combined processing of the Social Security General Affiliation File (SS) and Model 190 statements: Annual Summary of Withholdings and Advance Payments on Personal Income Taxes, of the State Tax Administration Agency (AEAT), along with the occupation and working time variables provided by a survey attached to the INE Quarterly Labour Cost Survey. Thus, the survey uses existing administrative data and does not increase the reporting burden obtaining most of the required information by the users.

The annual and four-yearly surveys are designed in the same way and their scope, reference periods, etc. are also the same. The random unit selection procedure corresponds to two-stage stratified sampling where the first stage units are local units, while the second stage units are the employees.

The first stage stratification criteria are the region, the economic activity and the size of the unit (in terms of number of employees). Once the sample of local units is available, the Social Security General Treasury provides the list of all the employees, identified by their affiliation numbers, included in these units during the reference year. A simple random sample of employees is taken within each of the selected local units according to the size of the unit.

In the case of the ASES, the sample selected at the first stage is the same as that of the Quarterly Labour Cost Survey. A questionnaire is sent to the local unit together with the quarterly one, with questions on the occupation and functions of the employees selected. The answers obtained on these two questions are used to produce the International Standard Classification of Occupations (ISCO) 2-digit code.

After receiving the response from the reporting units on occupation and carrying out the ISCO encoding, at the last stage the Tax Agency is asked for information on the earnings that the employees have received at that unit.

Using the Structure of earnings surveys for the preparation of LPI, the population, geographical and temporal scopes as well as the economic activity coverage of the index are derived from these surveys as detailed below:

The population scope is formed by all employees employed in the local units who have been registered in the Social Security for more than two months during the year, being October one of them.

Chairmen, board members and, in general, any personnel whose remuneration is not mainly in the form of wages/salary, but based on commission or profits are excluded.

The geographic scope encompasses the whole of Spain, with results disaggregated by regions.

As for **economic activity coverage**, local units with business activity across the three main sectors are investigated: Industry, Construction and Services, specifically those centres with economic activities comprised in sections B to S of NACE rev.2.

Finally, with regard to the **time scope**, the reference period is the calendar year.

3. Methodology

3.1 Major index formulas

The index is calculated as a Laspeyres chain index.

1) Definitions

Let c a basic cell composed of data from a defined set of employees, sorted by the main characteristic of the jobs (these variables are detailed in 3.2 section) in which they work. Then:

ω_c^k: is the hourly earnings for the employees working in c in year k.

h_c^k: are the hours worked by the employees working in c in year k.

2) The basic Laspeyres formula to calculate the LPI for year j with base year k is :

$$\mathrm{LPI}_{j(k)} = \frac{\sum_c \omega_c^j h_c^k}{\sum_c \omega_c^k h_c^k}$$

3) The annual link for year j to year j + 1, where $0 \leq j < j+1$ is defined by:

$$\mathrm{L}_{j,\,j+1} = \frac{\sum_c \omega_c^{j+1} h_c^j}{\sum_c \omega_c^j h_c^j}$$

4) The Laspeyres chain index formula for year j with reference year k (base year) is:

$$\mathrm{IPT}_{j(k)} = 100 * \mathrm{L}_{k,k+1} * L_{k+1,k+2,} * \ldots * L_{j-2,j-1} * IPT_{j(j-1)}$$

5) The annual link is the index with reference (base year) the previous year, therefore:

$$\mathrm{IPT}_{j(k)} = 100 * \mathrm{IPT}_{k+1(k)} * IPT_{k+2(k+1)} * \ldots * IPT_{j-1(j-2)} * IPT_{j(j-1)}$$

6) The Laspeyres chain index formula for year j for a set of Q cells c with reference year k is defined:

$$\mathrm{IPT}_{j(k),Q} = 100 * \mathrm{IPT}_{k+1(k)Q} * IPT_{k+2(k+1),Q} * \ldots * IPT_{j-1(j-2),Q} * IPT_{j(j-1),Q}$$

3.2 Level of disaggregation of the variables

The following variables and level of disaggregation are considered:

Economic activity: Section level of NACE Rev.2 in the scope of SES: B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R y S.

Size of the local unit: According to the number of employees as follows:

1: 1 - 4 employees

2: 5 - 9 employees

3: 10 - 19 employees

4: 20 - 49 employees

5: 50 - 99 employees

6: 100 - 199 employees

7: 200 - 499 employees

8: 500 and more employees

Region: Autonomous Community where the unit is located:

01: Andalucía (incluye Ceuta y Melilla)

02: Aragón

03: Asturias (Principado de)

04: Balears (Illes)

05: Canarias

06: Cantabria

07: Castilla y León

08: Castilla la Mancha

09: Cataluña

10: Comunitat Valenciana

11: Extremadura

12: Galicia

13: Madrid (Comunidad de)

14: Murcia (Región de)

15: Navarra (Comunidad Foral de)

16: País Vasco

17: Rioja (La)

Gender: Females (F) and Males (M).

Occupation: Major groups of ISCO-08. The groups 6 and 7 are joined due to problems of sample size in the SES survey.

Type of employment contract: indefinite duration and temporary/fixed duration

Contractual working time: full-time and part-time.

Employee's age: defined by the following ranges of age:

01: less than 25 years

02: 25- 34 years

03: 35 - 44 years

04: 45 - 54 years

05: 55 or more years

Employee's citizenship: resident with citizenship and resident with foreign citizenship.

Seniority in the local unit: defined by the following ranges of years:

1: less than 1 year

2: 1 - 3 years

3: 4 - 10 years

4: 11 - 20 years

5: 21 - 29 years

6: 30 or more years

As already indicated, the elementary indexes are calculated as the average hourly earnings in each combination of all these variables. Because of the degree of disaggregation, many combinations are obtained, which has the consequence that each combination contains information on a few employees, so the hourly earnings data obtained may not be accurate. Thus, more than 100,000 combinations are obtained and the sample size of the surveys are between 215,000-230,000 employees.

Another problem is that due to the large number of combinations, they are not the same every year; comparing two consecutive years, it can be noticed that there is a great variation since many are lost when the year changes, while new ones appear.

These problems could be avoided by defining more general characteristics for the cells, but this would imply that the elements (employees) belonging to these cells would not be as homogeneous as desirable. To overcome these difficulties, the LPI uses hedonic regression models that allow estimating the earnings per hour at each combination, regardless of whether a large number of employees is in the same cell in each period or not. Thus, the number of types considered and the degree of detail in the definition of these is higher, which significantly improve the fit.

3.3 Regression model applied

In the regression model applied for the calculation of the LPI, the explicative variables (main effects) are the classification variables of both the employee and the local unit mentioned in the previous section. As also detailed, all these variables take a finite number of values, and each possible combination of these values determines what is known as a cell.

The variable "contractual working time" has not been included in the regression model because the results obtained indicate that the coefficients associated with it are not significant. This result is consistent with what it would be expected, as it is the hourly earnings the variable analysed.

This model has the dependent variable of the neperian logarithm of the hourly earnings. This transformation is applied to capture the nonlinear relationship between the hourly earnings and the remaining variables, and also enables a simple interpretation of the coefficients or parameters of the model.

Moreover, the model includes the most significant double interactions between these main effects. The selection of these interactions has been performed using automatic

selection methods to establish the most significant ones and subsequently a detailed analysis of these, determines the best combination of them.

The following specified the regression model that is used for calculating the hourly earnings estimated, used in compiling the LPI. For each year a, it is assumed that the hourly earnings, G, of the employees belonging to cell c, is:

$$l_c^a = \ln G_c^a = x_c' \beta^a + \varepsilon_c^a \quad (1)$$

Where,

x_c' is a vector of dimension (1 x p), whose elements are equal to 0 or 1, depending on the characteristics that define cell c, in terms of main effects and interactions,

β^a is a vector of p unknown parameters, of dimension (p x 1), and

ε_c^a is the random component of the model in the year a.

Vector β^a defines the proportional effect on the hourly earnings expected of an employee of p dichotomous variables included in x_c' . The p unknown parameters include the constant and the parameters of the dichotomous variables associated with the main effects and the interactions of the model.

For each r possible categories that a main effect has, the model includes (r-1) parameters. If the interaction has (r x s) possible combinations of values, the model will have (r-1) x (s-1) parameters.

The distortions ε_c^a verify:

$$E[\varepsilon_c^a] = 0, Var[\varepsilon_c^a] = \sigma_a^2, Cov[\varepsilon_c^a, \varepsilon_d^a] = 0, \forall c \neq d \quad (2)$$

Once the model is defined, the vector β^a must be estimated each year with the information available. To this end, the model (1) is prepared in matrix notation, in the following manner:

$$L^a = X^a \beta^a + \varepsilon^a \quad (3)$$

where:

L^a is a vector of dimension (n^a x 1) which contains the elements of year a. That is, it contains as many rows as employees are in the sample of the survey of year a.

X^a is a matrix of dimension (n^a ×p), whose elements are equal to 0 or 1. In this matrix, each row represents an employee, and each column contains one of p characteristics that define said employee in year a,

β^a is a vector of dimension (p x 1), which contains p unknown parameters in year a. This includes the constant and the parameters of the dichotomous variables associated with the main effects and the interactions of the model, and

ε^a is a vector of dimension (n^a x 1) , which contains the random distortions of the model in year a This distortion vector verifies:

$$E[\varepsilon^a] = 0\,;\; Var[\varepsilon^a] = \sigma_a^2 I_{n^a x n^a} \qquad (4)$$

As the data used in the regression model are derived from samples drawn from a population with a given sample design, it is used ordinary least squares estimator weighted by the sampling weights (WOLS) from β^a:

$$\hat{\beta}^a = (X^{a'} W^a X^a)^{-1} X^a W^a L^a \qquad (5)$$

Where W^a is a diagonal matrix of dimension n^a x n^a of sampling weights,

and its variation is:

$$Var[\hat{\beta}^a] = \sigma_a^a (X^{a'} W^a X^a)^{-1} X^{a'} W^{a\,2} X^a (X^{a'} W^a X^a)^{-1} = V^a \qquad (6)$$

where the matrix V^a has dimension (p x p).

The vector $\hat{\beta}^a$ of parameters varies according to the data from each year, and is the fundamental element used for estimating the average hourly earnings per cell.

In the compilation of the LPI, it is necessary to have, for each year, the estimated average hourly earnings corresponding to each cell. This estimated hourly earnings is obtained using the formula (1); thus, the estimated hourly earnings of cell c, in year a, is the following:

$$G_c^a = \exp(x_c' \hat{\beta}^a) \qquad (7)$$

The problem with this estimator, which has a simple expression, is that it has a bias. In order to correct this bias, a variation of the estimator proposed by El-Shaarawi and Viveros (1997) is used:

$$\hat{G}_c^a = \exp\left\{ x_c' \hat{\beta}^a - \frac{1}{2} x_c' \hat{V}^a x_c + \frac{1}{2} \hat{\sigma}_a^2 \right\} \qquad (8)$$

The estimator (8) substantially corrects the bias of the estimator (7), assuming the normality of the errors ε_c^a .

In order to obtain the estimation of the variation that appears in the above expressions, the residuals e_c^a are defined as the difference between the neperian logarithms of the observed hourly earnings and the estimated hourly earnings, that is:

$$e_c^a = l_a^c - x_c' \hat{\beta}^a \qquad (9)$$

The variation $\hat{\sigma}_a^2$ is estimated with the average of the squared residual differences:

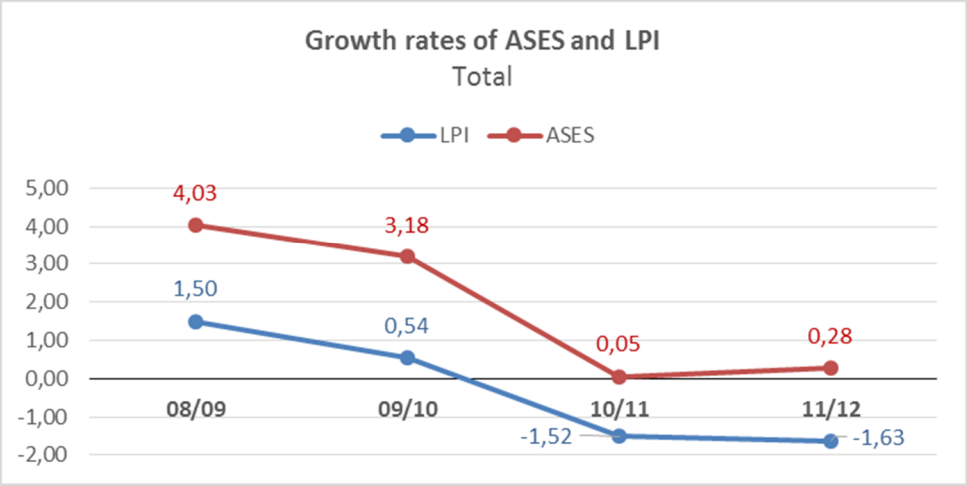
$$\hat{\sigma}_a^2 = \frac{1}{n^a - p} \sum_c^{n^a} (e_c^a)^2 \qquad (10)$$

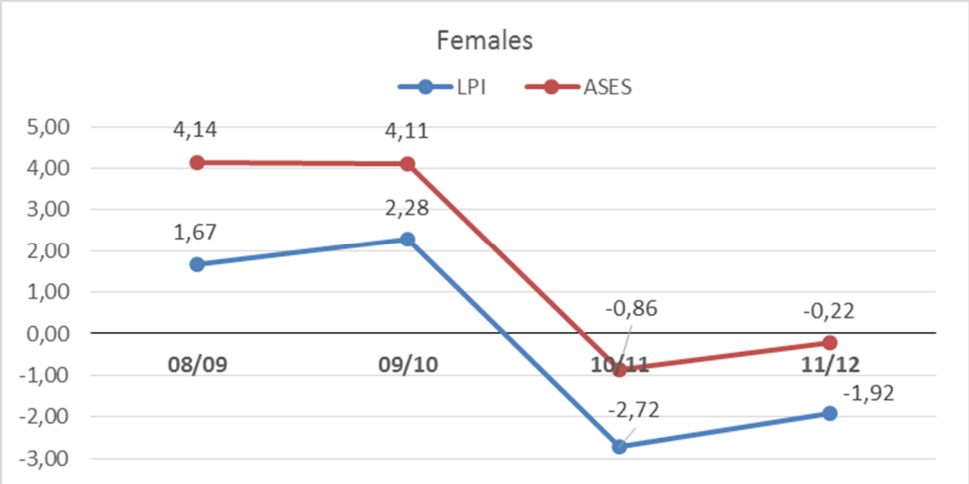
4. Preliminary results

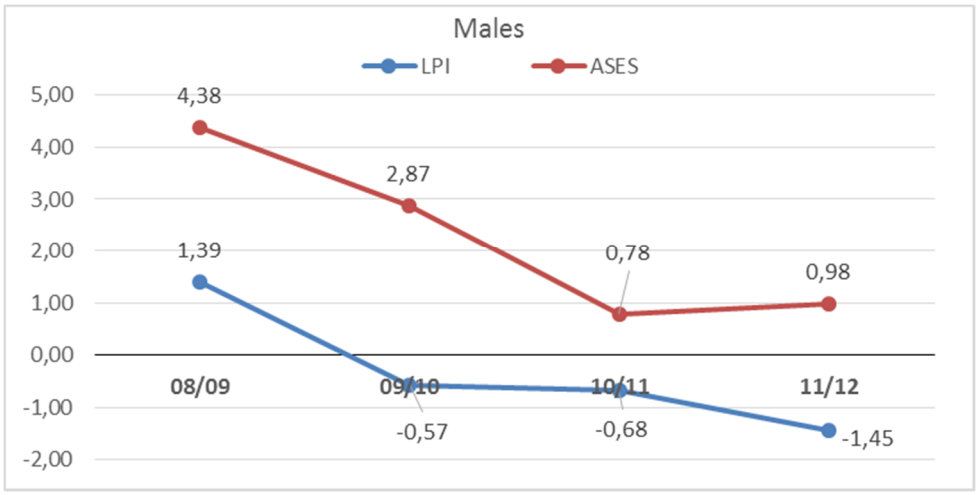
As an example, the result of the process of estimating the parameters of the regression model used in one of the years analysed (in 2010) is shown in the annex.

All variables are significant and the sign of the estimated coefficients is as to be expected in all studies on the earnings.

The method described here has been implemented using micro-data from structure of earnings surveys for the period 2008 to 2012. A comparison of the rates of change of the hourly earnings between the two statistics, LPI and ASES can be seen in the following graphs for some of the main variables:






Males
LPI
ASES
5,00
4,00
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-2,00
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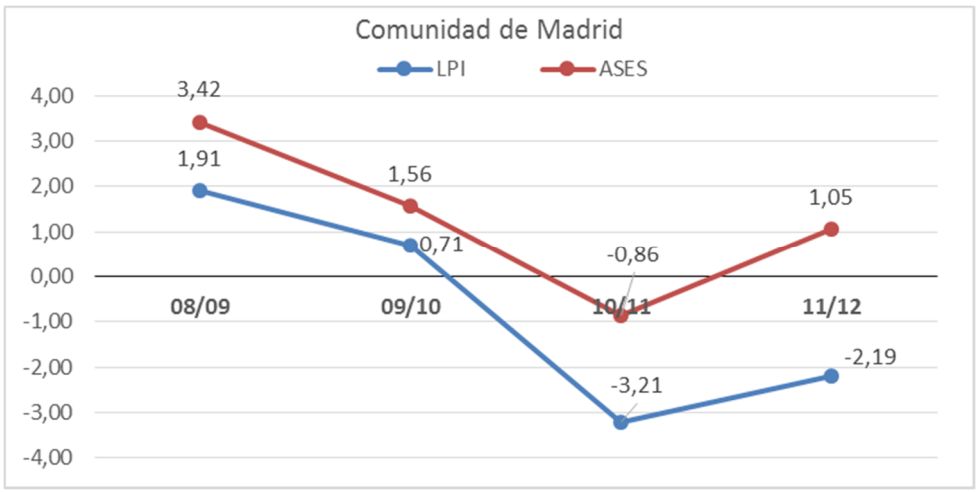
11/12


Comunidad de Madrid
LPI
ASES
4,00
3,00
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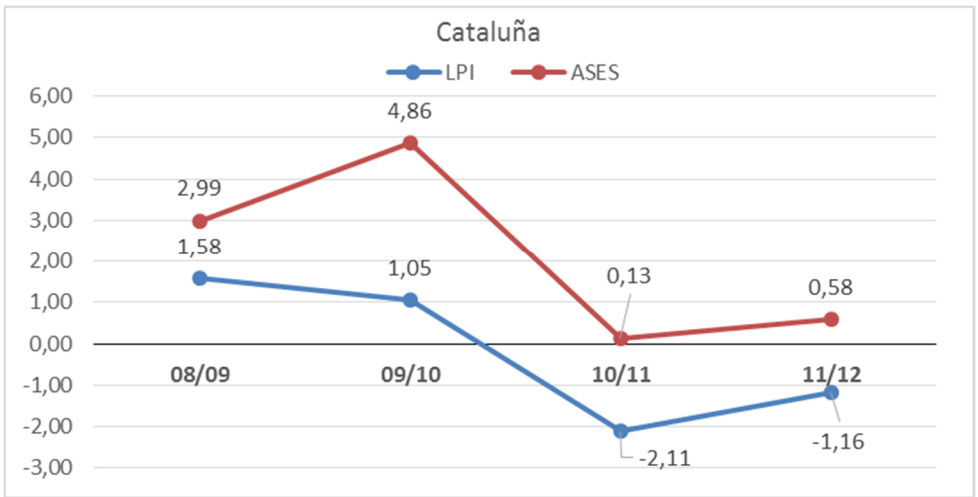
Cataluña
LPI
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6,00
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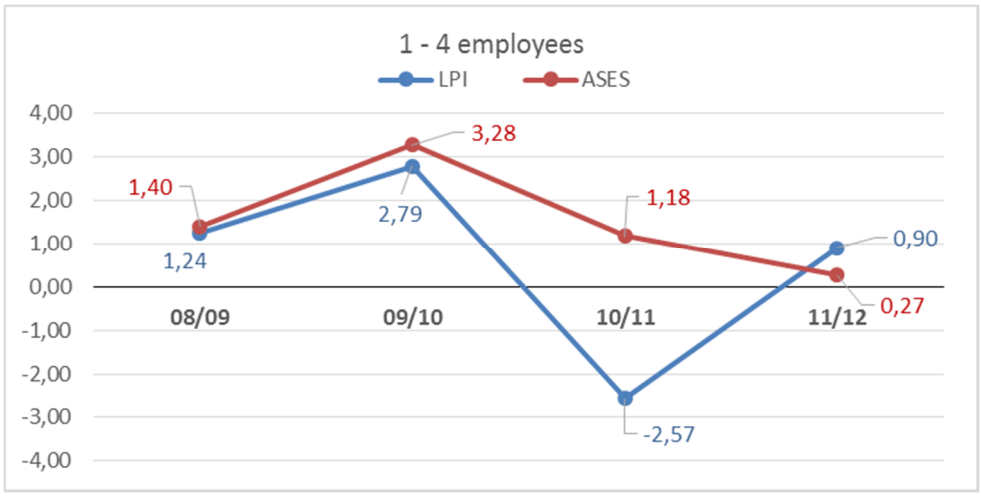
1 - 4 employees
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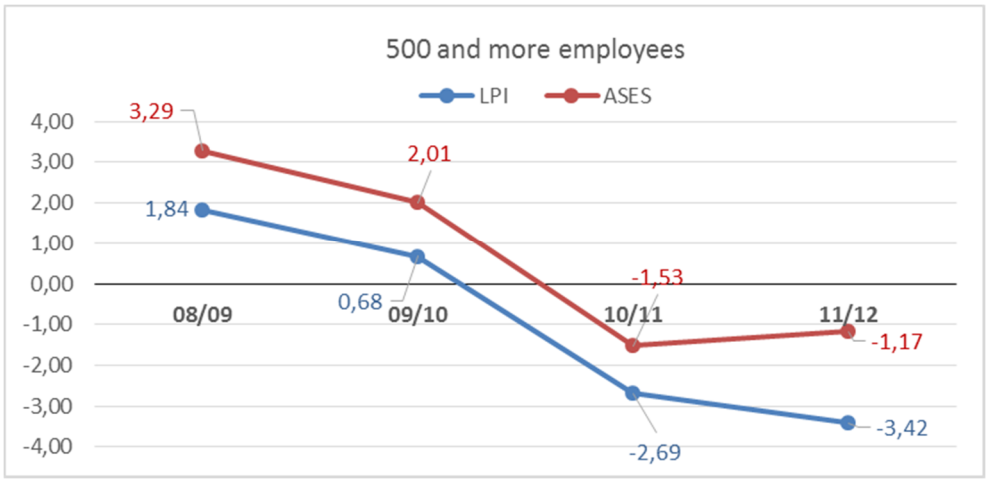
500 and more employees
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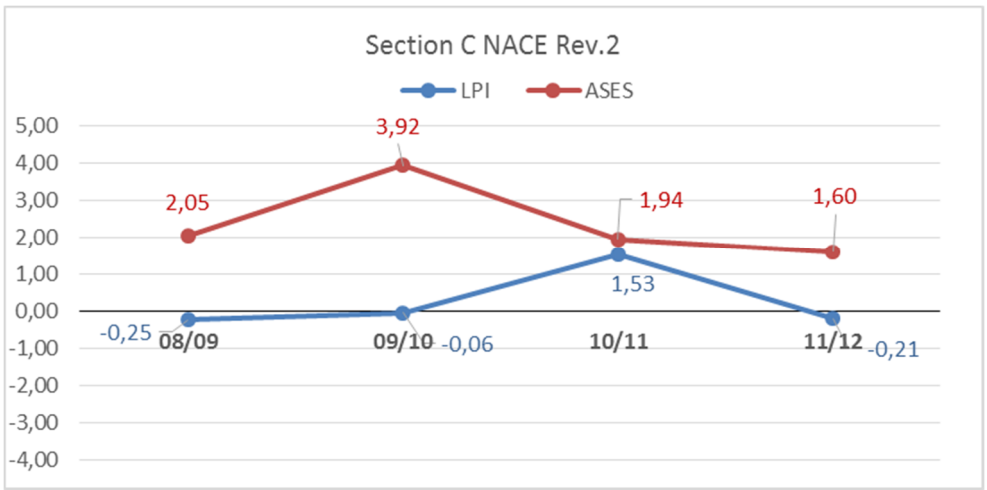
Section C NACE Rev.2
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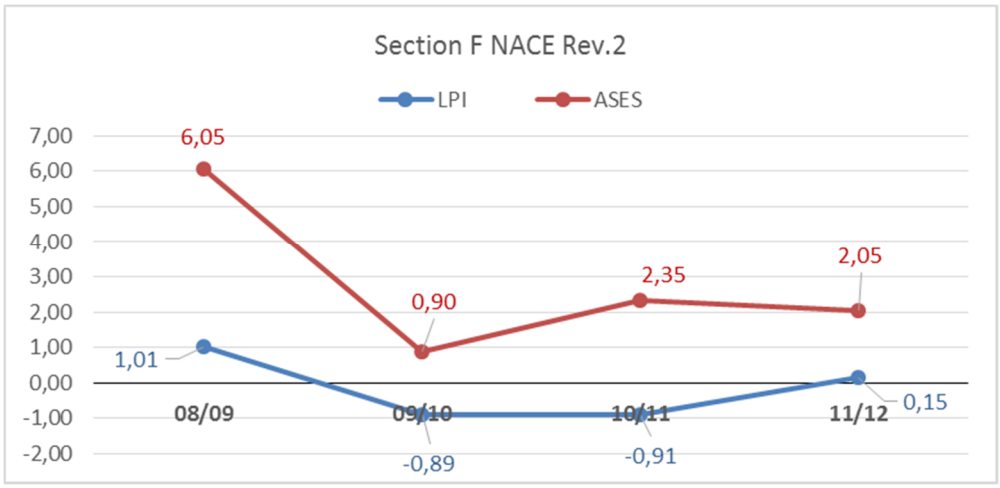
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-0,91
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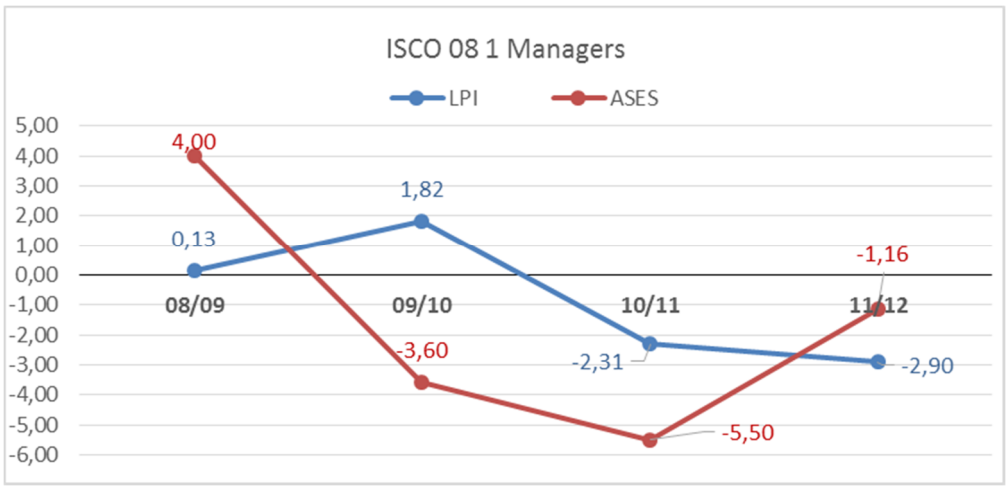
09/10
10/11
11/12


ISCO 08 1 Managers
LPI
ASES
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-4,00
-5,00
-6,00
4,00
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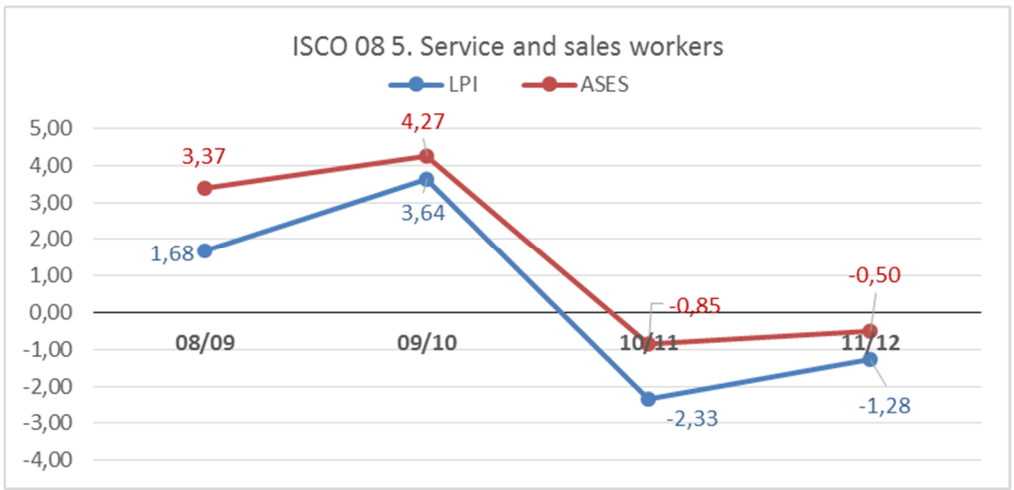
08/09
09/10
10/11
11/12


ISCO 08 5. Service and sales workers
LPI
ASES
5,00
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-2,00
-3,00
-4,00
4,27
3,37
3,64
1,68
-0,85
-0,50
-2,33
-1,28
08/09
09/10
10/11
11/12

5. Conclusions

- The results obtained using this methodology show that the changes in the employment composition during these last years have had an impact in the evolution of the hourly earnings shown by the classical surveys.

- The advantage of this method is its low cost because it is performed only by using existing sources.

- It is a novel technique that has already been used in other statistics as the Housing price index (HPI). The design and development process of the HPI has been carried out in coordination with the Statistics Office of the EU (Eurostat).

- It seems that this kind of indicator should be a short term indicator, quarterly at least, but the cost and burden to carry out a short term survey as the ASES give sense to obtain this statistic annually at least.

Annex

Regression model year 2010				
Estimated coefficients				
Parameters	**Estimator**	**Estándar desviation**	**t-value**	**Pr > |t|**
Constant	2,5615669	0,0310151	82,59	<,0001
SECC B	0,3325251	0,0241468	13,77	<,0001
SECC C	0,1558611	0,0110247	14,14	<,0001
SECC D	0,5979127	0,0233017	25,66	<,0001
SECC E	0,2272084	0,0169985	13,37	<,0001
SECC F	0,1791040	0,0117367	15,26	<,0001
SECC G	0,0800599	0,0116093	6,90	<,0001
SECC H	0,1932054	0,0157564	12,26	<,0001
SECC I	0,1251220	0,0146464	8,54	<,0001
SECC J	0,1466485	0,0183208	8,00	<,0001
SECC K	0,4142273	0,0157342	26,33	<,0001
SECC L	0,0865878	0,0213359	4,06	<,0001
SECC M	0,0881617	0,0124672	7,07	<,0001
SECC N	0,0134423	0,0125493	1,07	0,2841
SECC O	0,2197495	0,0162981	13,48	<,0001
SECC P	0,1060565	0,0163660	6,48	<,0001
SECC Q	0,1279895	0,0123852	10,33	<,0001
SECC R	0,0867447	0,0176551	4,91	<,0001
EST 1	-0,3868882	0,0096117	-40,25	<,0001
EST 2	-0,3340001	0,0106737	-31,29	<,0001
EST 3	-0,2903083	0,0094864	-30,60	<,0001
EST 4	-0,2227084	0,0094631	-23,53	<,0001
EST 5	-0,1617918	0,0095672	-16,91	<,0001
EST 6	-0,1156826	0,0095383	-12,13	<,0001
EST 7	-0,0735296	0,0086900	-8,46	<,0001
REGION 01	-0,0358151	0,0150478	-2,38	0,0173
REGION 02	0,0062444	0,0165194	0,38	0,7054
REGION 03	-0,0158851	0,0184970	-0,86	0,3905
REGION 04	0,0757550	0,0174713	4,34	<,0001
REGION 05	-0,1324823	0,0171882	-7,71	<,0001
REGION 06	-0,0379828	0,0180737	-2,10	0,0356
REGION 07	-0,0252654	0,0152965	-1,65	0,0986
REGION 08	-0,0493122	0,0162291	-3,04	0,0024
REGION 09	0,0554739	0,0140888	3,94	<,0001
REGION 10	-0,0705535	0,0151503	-4,66	<,0001
REGION 11	-0,1468481	0,0164608	-8,92	<,0001
REGION 12	-0,0953855	0,0152476	-6,26	<,0001
REGION 13	0,0214684	0,0145563	1,47	0,1403
REGION 14	-0,0167408	0,0215134	-0,78	0,4365
REGION 15	0,0900981	0,0194537	4,63	<,0001

Parameters	Estimator	Estándar desviation	t-value	Pr > |t|
REGION 16	0,1647259	0,0158991	10,36	<,0001
SEXO M	-0,0821004	0,0114743	-7,16	<,0001
OCU1_2 1	1,0259004	0,0378616	27,10	<,0001
OCU1_2 2	0,8339713	0,0184339	45,24	<,0001
OCU1_2 3	0,4959745	0,0173608	28,57	<,0001
OCU1_2 4	0,2557551	0,0187027	13,67	<,0001
OCU1_2 5	0,1303778	0,0184670	7,06	<,0001
OCU1_2 7	0,1692928	0,0157068	10,78	<,0001
OCU1_2 8	0,1521676	0,0173291	8,78	<,0001
TIPOCON 1	-0,0233676	0,01414581	-1,65	0,0986
GEDAD1 01	-0,150884	0,0227693	-6,63	<,0001
GEDAD1 02	-0,1234434	0,01711778	-7,21	<,0001
GEDAD1 03	-0,1400708	0,01698435	-8,25	<,0001
GEDAD1 04	-0,1461288	0,01618665	-9,03	<,0001
GNACI 1	0,0898196	0,0079623	11,28	<,0001
GANTI 1	-0,2108189	0,0185751	-11,35	<,0001
GANTI 2	-0,1827896	0,0177304	-10,31	<,0001
GANTI 3	-0,1294701	0,0174292	-7,43	<,0001
GANTI 4	-0,0675643	0,0175809	-3,84	0,0001
GANTI 5	-0,0491393	0,0188927	-2,60	0,0093
OCU1_2*GEDAD1 1 01	-0,6591608	0,1429609	-4,61	<,0001
OCU1_2*GEDAD1 1 02	-0,3048903	0,0515658	-5,91	<,0001
OCU1_2*GEDAD1 1 03	-0,0883236	0,0430485	-2,05	0,0402
OCU1_2*GEDAD1 1 04	-0,0175141	0,0454901	-0,39	0,7002
OCU1_2*GEDAD1 2 01	-0,5219200	0,0347110	-15,04	<,0001
OCU1_2*GEDAD1 2 02	-0,3156948	0,0203176	-15,54	<,0001
OCU1_2*GEDAD1 2 03	-0,1560482	0,0199643	-7,82	<,0001
OCU1_2*GEDAD1 2 04	-0,0640043	0,0183574	-3,49	0,0005
OCU1_2*GEDAD1 3 01	-0,3620425	0,0403877	-8,96	<,0001
OCU1_2*GEDAD1 3 02	-0,2249433	0,0192522	-11,68	<,0001
OCU1_2*GEDAD1 3 03	-0,1088895	0,0191608	-5,68	<,0001
OCU1_2*GEDAD1 3 04	-0,0625413	0,0175378	-3,57	0,0004
OCU1_2*GEDAD1 4 01	-0,2319810	0,0256205	-9,05	<,0001
OCU1_2*GEDAD1 4 02	-0,1664151	0,0199793	-8,33	<,0001
OCU1_2*GEDAD1 4 03	-0,0919999	0,0202160	-4,55	<,0001
OCU1_2*GEDAD1 4 04	-0,0509788	0,0189929	-2,68	0,0073
OCU1_2*GEDAD1 5 01	-0,0633742	0,0275606	-2,30	0,0215
OCU1_2*GEDAD1 5 02	-0,0753017	0,0206572	-3,65	0,0003
OCU1_2*GEDAD1 5 03	-0,0606078	0,0202323	-3,00	0,0027
OCU1_2*GEDAD1 5 04	-0,0246116	0,0177414	-1,39	0,1654
OCU1_2*GEDAD1 7 01	-0,1077340	0,0223129	-4,83	<,0001
OCU1_2*GEDAD1 7 02	-0,0631877	0,0173665	-3,64	0,0003
OCU1_2*GEDAD1 7 03	-0,0251887	0,0175876	-1,43	0,1521

Parameters	Estimator	Estándar desviation	t-value	Pr > |t|
OCU1_2*GEDAD1 7 04	-0,0228391	0,0155789	-1,47	0,1427
OCU1_2*GEDAD1 8 01	-0,1018007	0,0274478	-3,71	0,0002
OCU1_2*GEDAD1 8 02	-0,0938743	0,0189280	-4,96	<,0001
OCU1_2*GEDAD1 8 03	-0,0840116	0,0188273	-4,46	<,0001
OCU1_2*GEDAD1 8 04	-0,0626122	0,0185738	-3,37	0,0008
TIPOCON*GEDAD1 1 01	0,0239262	0,0206108	1,16	0,2457
TIPOCON*GEDAD1 1 02	0,0828187	0,0147819	5,60	<,0001
TIPOCON*GEDAD1 1 03	0,1240802	0,0149566	8,30	<,0001
TIPOCON*GEDAD1 1 04	0,1489488	0,0151653	9,82	<,0001
SEXO*GNACI M 1	-0,0767597	0,0115413	-6,65	<,0001