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THE SPANISH WAGE CURVE: EVIDENCE FROM THE 1990-91 EPF SURVEY

Abstract:

The analysis of Blanchflower and Oswald (1994) for different countries has established the existence of an inverse relationship between individual wages and local unemployment. Moreover, the coefficient for the elasticity between both variables has proved to be very close to –0.1 across areas and industries and over time. This relationship is known as the wage curve. The objective of the paper is to explore the existence of a wage curve for Spain. With this aim, we use individual data from the *Encuesta de Presupuestos Familiares* (Family Budgets Survey) for the year 1990-1991 to quantify the relationship between individual wages and local unemployment rates. The results show the existence of a wage curve with an elasticity of –0.06. This value is lower than in countries with more flexible labour markets and lower unemployment rates. However, the elasticity is higher when specific labour markets by gender and age are considered.

1. Introduction

In an influential work, Blanchflower and Oswald (1990, 1994) postulate the existence of a downward sloping relationship between individual wages and local unemployment rates. This relationship, known as wage curve, has proved to be some kind of empirical law. Blanchflower and Oswald (1994) present evidence on wage curves for several countries (including the United States, Britain, Canada, South Korea, Austria, Italy, Holland, Switzerland, Norway, Ireland, Australia and Germany), for different time periods, using different data sets and different definitions of the considered variables (annual earnings, monthly earnings or wage per hour and various levels of disaggregation of the unemployment level). Another interesting feature of this curve is that the elasticity of wages to unemployment is close to –0.1.

Other authors have also provided evidence of the existence of a wage curve for countries not considered in the Blanchflower and Oswald (1994) analysis: Groot *et al.* (1992) for the Netherlands, Janssens and Konings (1998) for Belgium; Pannenberg and Schwarze (1998) for East Germany and Hoddinot (1996) for Côte d'Ivoire, among others.

This paper investigates whether the Spanish labour market exhibits a wage curve. There are two reasons why such an analysis is of interest. First, to our knowledge, the evidence for the Spanish case is very scarce[1]. Sanromá and Ramos (1999) include the regional unemployment rate as an explanatory variable in an augmented Mincer equation –although with a different purpose to the one considered in this paper[2]- finding a negative and significant relationship with a coefficient close to –0.1. Second, the peculiarities of the Spanish labour market -with a practically non-existent regional mobility, very high and persistent unemployment rates and a very limited wage flexibility- make the analysis especially relevant.

The structure of the paper is as follows: first, in the next section, the usual specification for the wage curve is presented and different theoretical explanations of this empirical law are considered; in the third section, the data used for the empirical analysis are presented; and, next, the empirical results are shown; the paper ends summarising the main findings.

2. The wage curve: theoretical explanations and empirical evidence

As it has been mentioned in the previous section, the wage curve is a negative sloped relationship between individual wages and regional unemployment. This relationship has proved to be an empirical regularity and different theoretical explanations have been proposed to explain it. The usual empirical specification of the wage curve is that of an augmented Mincer equation where the endogenous variable is the individual wage and explanatory variables include the unemployment rate apart from the usual individual and job characteristics variables. When this kind of equations are econometrically estimated using data sets for different countries and time periods, the coefficient associated to unemployment is significant, negative and close to –0.1.

However, from a theoretical point view, the neoclassical theory predicts that wages will reach higher levels in the areas of higher unemployment, thereby balancing the risk of becoming unemployed, or in a similar way, equalling the flow of income from labour - or labour plus unemployment subsidies- in the different regions. This positive relationship between wages and unemployment has its origins in Adam Smith and was formalised by Harris and Todaro (1970), but it is not consistent with the empirical wage curve literature.

There have been different attempts to solve this puzzle. In fact, there are different theoretical models that are consistent with this negative relationship between individual wages and regional unemployment. In this sense, in the literature, two different kinds of models that predict this negative relationship have been proposed: efficiency wage models and bargaining models.

First, the justification of the wage curve in the framework of the theory of efficiency wages is based on the fact that when local unemployment is high, incentives to shirking are lower and the employer does not have to pay additional wages. According to Shapiro and Stiglitz (1984), when there are incentives to shirking and high monitoring costs, the employer has to pay higher wages to workers to avoid productivity slowdowns. However, when local unemployment is higher, the probability of finding alternative employment in case of being dismissed reduces and as a result the employer

does not have to pay additional wages. As a result, a negative relationship between wages and local unemployment is predicted.

Second, in the bargaining model, wages are the outcome of a negotiating process between unions and firms. When unemployment is high, the bargaining power of workers weakens because the alternative wage that workers face in case of laid-off is lower than before. Employers are conscious of this fact and try to negotiate lower wages. As a result of this bargaining process, a negative relationship appears between local unemployment and wages.

Summarising, at least, two different kind of models have been proposed in the literature that predict a negative relationship between wages and unemployment (i.e. a wage curve) as opposite to the theoretical prediction of Harris and Todaro (1970). However, it is important to remark that these approaches do not necessarily invalidate the model of Harris and Todaro, but they make it possible to work with the hypothesis that, in the short term- while migratory flows do not equalize the net advantage in regions-, the observable relationship between wages and unemployment is negative. On the opposite, in the long run, regions with high unemployment should be compensated by higher pay.

Back to the empirical literature, apart from the major findings previously mentioned, there are other results that should be mentioned. On one hand, different authors show that when not taking into account regional fixed effects, there is a higher probability of finding a significant coefficient for regional unemployment. The consideration of regional fixed effect is relevant as wage differences can be not related to unemployment differences, but to cultural differences or different price levels. So, if these effects are not considered the elasticity of wages to unemployment will usually be overestimated.

On the other hand, Blanchflower and Oswald (1994) present a variety of evidence on differences in the effect on wages of the unemployment for different kinds of workers or in different industries. There are different hypotheses that try to shed light on the variation of the slope of the wage curve across different group of individuals. While the first explanation is related to how wages are measured, the other two are much more interesting from an economic point of view.

A first possible explanation is related to how wages are measured in the considered equation (Card, 1995). When annual earnings are considered, differences in the cyclical sensitivity of worked hours can explain differences among groups. As annual earnings are the product of annual hours and hourly wages, a higher elasticity of certain groups could be related to this fact. For example, if in a recession the number of hours worked by women decreases faster than for men (and assuming that hourly wages remains stable for both), women's annual wages will decrease faster than men's while unemployment for women will increase faster than for men. If this is true, the negative relationship among unemployment (increasing) and annual wages (decreasing) will obviously be more intense for women than for men.

A second explanation is related to the intuition behind the previously exposed bargaining model. When the bargaining power of a group of workers is negligible, unemployment rates will have great effects on wage determination. In this sense, groups of workers with higher bargaining power will not take into consideration the evolution of unemployment rates when negotiating wages. For them, the absolute value of the coefficient of unemployment on wages will necessarily be lower than in the previous case.

Last, as Turunen (1998) points out, the variation in the slope of disaggregated wage curves could generally indicate different responses to local labour market conditions. In particular, labour market groups that are more protected from the outside labour market by firing costs of by specific human capital investments will be less responsive to local unemployment. So, the idea is that if wages in these protected labour markets are isolated from cyclical shocks, they will be less responsive to local labour market conditions. This fact means that these groups usually have lowest absolute values for the elasticity of wages to unemployment. This would explain why wages of senior workers vary less with current labour market conditions that younger ones, or for example, why wages of public sector workers are insensitive to local labour market conditions.

Taking into account the literature briefly summarised here, the analysis of the wage-local-unemployment relationship for the Spanish case is especially relevant due to the institutional characteristics of its labour market. In 1990, year of reference of the considered data base, the Spanish labour market was characterised by an intermediate

collective bargaining system –as most continental European countries- with a reduced union density (13%), but with a high coverage (76%) (OECD, 1997). It is also important to highlight that firing costs were high (OECD, 1994, chapter 6). These features suggest the existence of a high bargaining strength of insiders. Moreover, the benefit system was quite generous until 1992, especially in terms of the replacement ratio but also in terms of duration (OECD, 1988). Long-term unemployment represented about the 53% of total unemployment and the underground economy was quite important. These data permit to conclude that there were a low search intensity and a low eligibility of unemployed and, as a result, a very reduced competition for employed and a reduced pressure on wages. Due to these institutional facts, one can think of a low elasticity of wages to unemployment or even in the non-existence of a wage curve.

Moreover, the unemployment rate in 1990 was 16.3%, nearly the double of the unemployment rate in the European Union countries. This data also suggests a low elasticity as the international evidence show that the curve is flatter when the unemployment rate is higher.

But, there are other facts that suggest that the result can be the contrary: a higher elasticity of wages to unemployment. From 1984, fixed-term contracts are introduced in the Spanish labour market. In 1990, this kind of contracts represented the 30.4% of total employees. This fact implies a higher job rotation and a higher exposure of workers –and their wages- to labour market conditions.

It is interesting, then, to test which is the dominant effect -institutional rigidities *versus* contractual flexibility- and to analyse the possible existence of a dual labour market between these two collectives of workers: those with fixed-term contracts and those with permanent contracts.

3. Data

The data used in this paper are based on the *Encuesta de Presupuestos Familiares* (Family Budget Survey) carried out by the *INE* (the Spanish Institute of Statistics) for the second quarter of 1990 to the first quarter of 1991. The basic purpose of this survey was the study of the expenditure made on goods and services by Spanish families.

Nevertheless, the span of the statistical operation was used to collect information of diverse types about Spanish families. In this additional information we found information about personal and job characteristics and wages, among others. The availability of this broad individualised information, and the fact that this information is at the provincial level suggested its use in this paper. The earnings variable that comes from this data is the annual incomes from paid employment. To avoid the inclusion of inaccurated data, we have only used information about the 16.949 persons who worked in non-agricultural industries and all the additional necessary information was provided. It is important to remark that the survey does not provide information about the kind of contract of workers (fixed term or permanent contract).

Data about the average unemployment rate between the second quarter of 1990 and the first quarter of 1991 have been taken from *Encuesta de Población Activa* (Labour Force Survey) which was carried out by the INE on 63.000 Spanish homes.

The regional detail considered in this paper is the *provincia* (NUTS-III) as it is the lowest level of regional aggregation for both databases. As it will be seen in the next section, we have also used information about unemployment rates by gender and for different activity sectors keeping the same level of territorial detail.

4. Econometric results

The methodological approach used in this paper is the usual in this literature. In particular, the logarithm of annual wages is regressed on a number of control variables related to personal and job characteristics and the unemployment rate. A detailed list of control variables is presented in annex B and full results for every model are available from the authors on request. In table 1 in annex A, replication of the different initial specifications for the wage curve as proposed by Blanchflower and Oswald (1994) are presented. To test for non-linearities, this specification also includes two different non-linear specifications. In particular, the following models are considered:

- The natural logarithm of the unemployment rate (model 1)
- The logarithm of the unemployment rate and its cube (model 2)
- The unemployment rate entered as a level (model 3)

- The unemployment and its squared (model 4)
- The inverse of the unemployment rate (model 5)

In model 1, the coefficient on the natural logarithm of the unemployment rate is negative and significant as expected with a magnitude close to –0.1, the value found for most countries. Results using the natural logarithm of unemployment or the unemployment rate (model 3) are similar when values of the elasticities are considered. When considered jointly, cubic (model 2) and quadratic (model 3) terms, include to test for non-linearities in the wage curve, are not significant. For this reason, the natural logarithm of the unemployment rate will be considered the standard specification in the rest of the paper (as in Blanchflower and Oswald, 1994). Moreover, this specification has the advantage that the coefficient on unemployment is directly interpretable as the elasticity of wages to unemployment.

Although the previous results support the existence of a wage curve for the Spanish economy, it is important to notice that these models did not include regional and sectoral fixed effects. As it has been exposed in section 2, these variables are relevant for the analysis as among certain regions, wage differences can be not related to unemployment differences, but to the different industrial structures, cultural differences or different price levels. So, if these effects are not considered the elasticity of wages to unemployment could be overestimated. Table 2 presents the results for the logarithm of the unemployment rate when including regional and sectoral dummy variables (see annex C). In general, the coefficient for the unemployment is still negative but not significant at usual levels.

However, these results cannot be interpreted as evidence of the inexistence of a wage curve for Spain. As in Groot *et al.* (1992), we refine the measure of the unemployment rate using three different definitions of the regional unemployment rates:

- Unemployment rates by *provincia* (NUTS-III) and gender
- Unemployment rates by *provincia* and activity sector
- Unemployment rates by autonomous community (NUTS-II) and age[3]

These refined unemployment rates are probably a better indicator of the relevant labour market conditions which the individual faces than the regional unemployment rates are.

Results when unemployment rates by *provincia* and gender are considered are shown in table 3. Different models in this table show a significant and negative relationship between provincial-gender unemployment and individual wages. This relationship is robust to the inclusion of regional and sectoral dummies. The included regional dummies correspond to the next level of territorial aggregation, NUTS-II, and the equivalence between NUTS-III regions (*provincias*) and NUTS-II regions (autonomous community) is shown in appendix C. In reference to sectoral dummies, nine different sectors are being considered as survey data do not offer more detailed information. Sector description is also shown in appendix C.

In table 4, a wage curve only for men is estimated. The coefficient for unemployment is negative and significant even when regional and sectoral dummies are included. It is slightly higher than in regressions with aggregated unemployment.

In table 5, the results for women are presented. In each model, the coefficient on unemployment is negative and significant. Its magnitude is surprisingly high in models 2 and 4 where regional and sectoral dummies are included. In fact, the high magnitude of the coefficient of the wage curve for women contrasts with the value for men (more than five times higher). Opposite to the evidence of other countries (for example, Janssens and Konings, 1998 for Belgium), this fact might indicate that the Spanish female labour market is more competitive than the male one. Regions with higher unemployment rates for women are also the regions where lower wages are paid as there is much more competition for jobs. There are three possible explanations of why this holds for women but not so intensely for men.

A first reason is related with the fact that information about wages is refereed to the whole year. As the unemployment rate is higher for women (24.2%) than for men (12.0%), the probability for women of being unemployed during some months of the year is higher. These months of unemployment imply lower annual earnings. There is, then, an inverse relationship between unemployment rates and annual earnings for women that can overestimate the elasticity of the wage curve.

The second reason of this highest elasticity in the wage curve for women is related with the highest importance of fixed term contracts among women. While in 1990 the value for men was 28.2%**,** for women was 35.2%. The highest rotation of the women labour force in the Spanish labour market is probably the cause of a higher exposure to the market competitive pressure and a higher sensibility of wages to unemployment.

A third explanation is based in the lowest bargaining power of women. Most employed women work in industries such as textile and shoes (62% of employees of this sector were women), retail sales (49.6% of employees), health services (68.2%), personal services (77.3%) and domestic services (77.3%). In these industries, firms are small and they operate in more competitive sectors and some of them also face strong demand fluctuations. In these activities, fixed term contracts and the rotation of labour force is high while union strength is very low. All these conditions generate a high sensibility of wages to labour market conditions.

It is also important to remark that the value for the aggregated elasticity of wages to unemployment (-0.057) is smaller than the value for men (-0.066) and women (-0.360) separately. A possible explanation is that when considering more relevant labour market conditions, the competition among unemployed is appreciated much more clearly and this increases the effect of unemployment rates on wages. This fact is common to other regional analysis of labour markets (López-Tamayo, 2000).

When refining the measure of unemployment using unemployment rates by region (*provincia*) and activity sector, the coefficient is negative, significant and with a magnitude of –0.124 even when regional and sectoral dummies are included (table 6).

In tables 7, 8 and 9, the results of estimating wage curves for individual who develop their professional activity in manufacturing, building and services sectors are presented. It has not been possible to obtain more detailed results in terms of activity sectors because data on unemployment at a provincial level is only provided for agriculture, manufacturing, building and services. The results in tables 7 and 9 show that there is no clear evidence of a wage curve for manufacturing and services sectors when regional

and sectoral dummies are included in the specification. However, as it can be seen in table 8, there is clear evidence for a wage curve for the building sector.

The same arguments could be highlighted again. This is a sector with a high proportion (53.6%) of fixed term contracts given the characteristics of the building activity. This could be the reason because the process of wage setting is more competitive than in other sectors, as employment opportunities depend clearly of the demand evolution. In consequence, wages are low when unemployment is high and they increase when unemployment is low. Other relevant feature is the following: there is a specific labour market for the building sector, but may be more than one for manufacturing and for the services sector[4].

Last, the results obtained when unemployment rates by autonomous community and age are considered, are presented in table 10. The considered unemployment rates distinguish between four age-groups: workers between 16 and 19 years old, between 20 and 24, 25-54 and, last, 55-65 with a regional detail corresponding to the autonomous community (see final note 3). From table 10, it can be seen that the coefficient of unemployment is negative, significant and with a magnitude of –0.133. Again, the value is higher than the coefficient when using unemployment rates by *provincia* and gender (-0.057).

In tables 11, 12, 13 and 14, the results of estimating wage curves for the different age groups are shown. First of all, it is important to notice that for every age group, the coefficient on unemployment is negative and significant after including sectoral dummies. Second, there are great differences in terms of the magnitude of the coefficient among age groups. While younger workers' wages are more responsive to regional unemployment, the elasticity of wages to unemployment for older workers is lower. For workers between 16-19 and 20-24 there are no significant differences in terms of the value of the coefficient on unemployment (-0.264 for both). On the opposite, for workers between 25 and 54 years old the value is very close to the usual value of –0.1 and for oldest workers the value is lower to that (-0.062). The justification of this result is quite obvious. Young workers are contracted for fixed terms (69.2% of them) and have a high rotation while this is not the case for workers older than 55. Moreover, firing costs are calculated considering workers' tenure, so it is usually more

expensive to dismiss older workers as they have a high tenure. Also, if older workers become unemployed, they have benefits during a long time period and when finished, under certain conditions, they can access early retirement. So, the pressure that older unemployed workers can exert on available jobs (and wages) is minimal. Again the interpretation of the results is similar to the previous refinements of the unemployment measures: when labour market conditions are properly specified, more competition among workers and unemployed imply a greater response of wages to unemployment

To summarise the obtained results, we find evidence supporting a wage curve for the Spanish economy with an elasticity of individual wages to regional unemployment of –0.06 for male and women taken together. When using unemployment rates of region and activity sector, this value increases up to –0.124 and, last, using region and age unemployment rates, the value is –0.133. It seems, then, that when trying to refine the measurement of the unemployment rate affecting the individual, the value of the elasticity increases substantially as competition in labour markets is better considered.

5. Conclusions

The principal finding of this paper is the existence of a wage curve for the Spanish economy with an elasticity of –0.06. This result would be consistent with the idea that in presence of high unemployment rates, the wage curve is flatter. This would imply that from certain levels of unemployment, a higher number of unemployed does not affect wage setting. The results are also consistent with the idea that in the nineties, the Spanish labour market was less flexible than in other European labour markets. Moreover, the available evidence for the Spanish labour market from macroeconomic wage equations at a national level have also detected a low elasticity of wages to unemployment (Layard *et al.*, 1991, chapter 9; Viñals and Jimeno, 1997, and Sanromá and Ramos, 1998, among others)**.**

A second interesting fact that can be highlighted from the results is the relevance of using a refined measure of unemployment when analysing the relationship between regional unemployment and individual wages. In this sense, the value of the elasticity of wages to unemployment increases when the considered unemployment rate better approximates the relevant unemployment rate for the individual. This fact could imply

that labour markets are overisolated as there is a few mobility among areas, activity sectors, qualifications and groups. And, moreover, there is a clearly duality between workers with permanent contacts and those with fixed term contracts.

Last, the results show that the labour markets of female and young workers are substantially more competitive than the male and older workers labour market. The elasticity of individual wages to unemployment is substantially higher for this kind of workers. The results suggest the existence of a deep duality in the Spanish labour market. There is a primary labour market formed by male workers of medium age, with permanent contracts and with high levels of specific human capital. These workers' wages would be much less influenced by labour market conditions.

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7. Final notes

[1] Although Canziani (1997) provides evidence for the relationship between individual wages and unemployment rates for Spain, these unemployment rates are not regional but by gender and age group.

[2] The unemployment rate is considered as a potential explanatory variable of interprovincial wage differences in Spain.

[3] It has not been possible to keep the same level of territorial analysis due to data availability. So, for this reason, we have considered the immediately next level of territorial aggregation, which is the Autonomous Community (NUTS-II).

[4] In 1990, the 10.9% of total employees worked in the building sector, the 29.8% worked in the manufacturing sector and the left 59.2% in the services sector.

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ANNEX A. Wage curve estimates

Table 1

OLS estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Log Provincial U	-0.121 (-10.001)	0.023 (0.384)			
(Log Provincial U)^3		-0.007 (-2.468)			
Provincial U			-0.008 (-10.176)	-0.015 (-4.228)	
(Provincial U)^2				0.2*10-3 (1.809)	
Inv Provincial U					1.225 (8.447)
Intercept	13.173	12.928	12.976	13.034	12.755
Adjusted R2	0.419	0.419	0.418	0.419	0.418
N	16949	16949	16949	16949	16949
F	382.371	371.080	382.560	371.173	380.835

Table 2

OLS estimation	Model 1	Model 2	Model 3
Log Provincial U	-0.026 (-1.321)	-0.118 (-9.834)	-0.029 (-1.484)
Intercept	12.858	13.149	12.848
Regional dummies	16	-	16
Sectoral dummies	-	8	8
Adjusted R2	0.424	0.421	0.426
N	16949	16949	16949
F	260.400	309.658	225.410

Table 3

OLS estimation	Model 1	Model 2	Model 3	Model 4
Log Provincial U by gender	-0.081 (-8.742)	-0.063 (-2.717)	-0.078 (-8.495)	-0.057 (-2.459)
Intercept	13.030	13.014	13.007	12.975
Regional dummies	-	48	-	48
Sectoral dummies	-	-	8	8
Adjusted R2	0.419	0.431	0.422	0.434
N	16949	16949	16949	16949
F	381.107	159.975	308.602	146.811

Table 4

OLS estimation	Model 1	Model 2	Model 3	Model 4
Log Provincial U men	-0.092 (-9.827)	-0.072 (-2.432)	-0.089 (-9.564)	-0.066 (-2.224)
Intercept	13.181	13.163	13.138	13.101
Regional dummies	-	48	-	48
Sectoral dummies	-	-	8	8
Adjusted R2	0.399	0.414	0.406	0.420
N	11498	11498	11498	11498
F	247.555	102.095	202.476	95.061

Table 5

OLS estimation	Model 1	Model 2	Model 3	Model 4
Log Provincial U women	-0.062 (-2.693)	-0.375 (-2.894)	-0.061 (-2.620)	-0.360 (-2.776)
Intercept	12.700	13.752	12.727	13.727
Regional dummies	-	48	-	49
Sectoral dummies	-	-	8	8
Adjusted R2	0.358	0.383	0.361	0.385
N	5451	5451	5451	5451
F	102.446	42.684	81.884	39.068

Table 6

OLS estimation	Model 1	Model 2	Model 3	Model 4
Log Provincial U by activity sector	-0.131 (-11.378)	-0.109 (-4.835)	-0.131 (-11.168)	-0.124 (-5.131)
Intercept	13.125	13.072	13.107	13.085
Regional dummies	-	48	-	48
Sectoral dummies	-	-	8	8
Adjusted R2	0.419	0.429	0.422	0.432
N	16949	16949	16949	16949
F	383.946	158.610	310.866	145.779

Table 7

OLS estimation	Model 1	Model 2	Model 3	Model 4
Log Provincial U manufacturing	-0.141 (-6.708)	0.003 (0.110)	-0.132 (-6.301)	0.009 (0.307)
Intercept	13.146	12.746	13.066	12.677
Regional dummies	-	16	-	16
Sectoral dummies	-	-	3	3
Adjusted R2	0.429	0.437	0.434	0.441
N	4734	4734	4734	4734
F	116.030	79.175	107.929	75.800

Table 8

OLS estimation	Model 1	Model 2
Log Provincial U building	-0.198 (-8.671)	-0.100 (-2.279)
Intercept	13.252	12.920
Regional dummies	-	16
Adjusted R2	0.233	0.236
N	1898	1898
F	22.394	14.652

Table 9

OLS estimation	Model 1	Model 2	Model 3	Model 4
Log Provincial U services	-0.097 (-5.556)	-0.047 (-1.656)	-0.095 (-5.459)	-0.048 (-1.682)
Intercept	13.056	12.923	13.054	12.930
Regional dummies	-	16	-	16
Sectoral dummies	-	-	3	3
Adjusted R2	0.444	0.449	0.445	0.449
N	10317	10317	10317	10317
F	275.699	184.100	252.081	173.672

Table 10

OLS estimation	Model 1	Model 2
Log U Aut. Com. Age	-0.135 (-12.165)	-0.133 (-12.056)
Intercept	13.304	13.281
Sectoral dummies	-	8
Adjusted R2	0.421	0.423
N	16949	16949
F	384.938	311.753

Table 11

OLS estimation	Model 1	Model 2
Log U Aut. Com. 16-19	-0.306 (-3.150)	-0.264 (-2.717)
Intercept	12.985	12.901
Sectoral dummies	-	8
Adjusted R2	0.096	0.111
N	854	854
F	4.491	4.138

Table 12

OLS estimation	Model 1	Model 2
Log U Aut. Com. 20-24	-0.271 (-5.141)	-0.264 (-5.020)
Intercept	13.579	13.606
Sectoral dummies	-	8
Adjusted R2	0.117	0.124
N	2366	2366
F	11.125	9.590

Table 13

OLS estimation	Model 1	Model 2
Log U Aut. Com. 25-54	-0.114 (-6.978)	-0.108 (-6.657)
Intercept	13.337	13.295
Sectoral dummies	-	8
Adjusted R2	0.391	0.395
N	12043	12043
F	242.201	197.126

Table 14

OLS estimation	Model 1	Model 2
Log U Aut. Com. 55-65	-0.069 (-2.815)	-0.062 (-2.494)
Intercept	13.217	13.138
Sectoral dummies	-	8
Adjusted R2	0.448	0.454
N	1686	1686
F	43.767	36.070

ANNEX B. Explanatory variables included in the augmented Mincer equation

Personal characteristics

- Gender
- Main sustainer
- Schooling years

Levels of study	Schooling years	Description
	0 years	Illiterate-without studies
Elementary	6 years	Primary education
	9 years	EGB or equivalent
Medium	11 years	Technical studies, first degree (FP-1)
	12 years	BUP or equivalent
previous to high	13 years	COU
	14 years	Technical studies, second degree (FP-2)
High	16 years (sch8)	Medium university studies or equivalent
	18 years (sch9)	High university studies or equivalent

- Experience (age-schooling years-6) and its square

Job characteristics

- Part-time job
- Occupation description

Law and science professionals and technicians, teachers
Artistic and sports professionals and technicians
Public sector managers and officers
Office, transport and communications services managers
Administrative services workers
Managers of companies, commercial establishments and in hotels and catering
Sales executives
Traders,
Non-sale services workers
Shop managers, foremen and persons in charge
Extraction of minerals industry workers
Elaboration of minerals industry workers
Chemical industry workers
Food, wood, clothes, shoes, furniture, etc. Industry workers
Electric and electronic technicians
Graphic arts, paper and plastic industry workers
Construction workers
Drivers
Labourers

ANNEX C. Territorial and activity sector dummies

Autonomous community	*Provinces*	*Autonomous community*	*Provinces*
Andalucia	Almería	Castilla-La Mancha	Albacete
	Cádiz		Ciudad Real
	Córdoba		Cuenca
	Granada		Guadalajara
	Huelva		Toledo
	Jaen	Cataluña	Barcelona
	Málaga		Girona
	Sevilla		Lleida
Aragón	Huesca		Tarragona
	Teruel	Comunidad Valenciana	Alicante
	Zaragoza		Castellón de la Plana
Asturias	Asturias		Valencia
Baleares	Baleares	Extremadura	Badajoz
Canarias	Palmas (Las)		Cáceres
	Sta. Cruz Tenerife	Galicia	Coruña (La)
Cantabria	Cantabria		Lugo
Castilla y León	Avila		Orense
	Burgos		Pontevedra
	León	Madrid	Madrid
	Palencia	Murcia	Murcia
	Salamanca	Navarra	Navarra
	Segovia	País Vasco	Alava
	Soria		Guipúzcoa
	Valladolid		Vizcaya
	Zamora	Rioja (La)	Rioja (La)

Manufacturing	Energy and water Extraction and non-energetic minerals transformation, chemistry industry Metallic elaboration industries, precision mechanics Other manufacturing industries
Building	Building
Services	Commerce, restaurants and hotels, repairs Transport and communications Financial institutions, insurance, services to firms and rents Other services