4. UNEMPLOYMENT, GENDER AND LABOR FORCE PARTICIPATION IN SPAIN: FUTURE TRENDS IN LABOR MARKET[1]

Emilio CONGREGADO[2]
Monica CARMONA[3]
Antonio A. GOLPE[4]
André VAN STEL[5]

Abstract

The Spanish seasonally adjusted unemployment rate stood at 26.1 percent in the last quarter of 2012, almost three percentage points higher than one year earlier and almost 12 percentage points higher than at the end of 2008. Although the exponential growth of Spanish unemployment is mainly caused by a lower demand for labor, there is also a second cause, viz. an increased supply of labor, reflected by higher participation rates. In this paper we investigate how participation rates are affected by business cycle fluctuations, while accounting for different labor market behaviour of men and women. Based on an analysis using Spanish quarterly data over the period 1976-2012, we find evidence for a linear discouraged worker effect for men (i.e., decreasing participation rates during recessions), implying that male participation rates will continue to show a weak but sustained decrease as long as unemployment keeps rising. On the contrary, we find a significant 'added' worker effect (i.e., increasing participation rates during recessions) for women, but only when unemployment rates are below a certain threshold. Since the Spanish unemployment rate just recently (in 2012) passed this threshold, our results suggest that the added worker effect for women no longer applies and that, accordingly, the recent increase in female participation rates now comes to an end.

Keywords: discouraged worker effect; added worker effect; non-linearity; Spain
JEL Classification: J22, J64, E24, C32

[1] *The research has been supported by the framework of the research program PAI (Junta de Andalucía) and XVII Plan Propio de Investigación (Universidad de Huelva).*
[2] Corresponding author, Department of Economics, University of Huelva, Spain. E-mail: congregado@uhu.es.
[3] Department of Management and Marketing, University of Huelva (Spain) E-mail:monica@uhu.es
[4] Department of Economics, University of Huelva, Spain. E-mail: antonio.golpe@dehie.uhu.es.
[5] University of Amsterdam, Faculty of Economics and Business, Department of Economics, Address Roetersstraat 11, 1018 WB Amsterdam, the Netherlands, E-mail: a.vanstel@uva.nl.

I. Introduction

The Spanish unemployment rate stood at 26.1 percent in the fourth quarter of 2012, the second highest rate in the 27-nations EU (Eurostat, 2013).[6] The number of people out of work rose to 5.7 million, the highest number ever in the History of Spain. But the future is scarier: some forecasters talk of 27%-28.5% unemployment (over 6.5 mill. people) in 2013. However, unemployment tends to be underestimated because forecasts do not take account of fluctuations in the labor force participation rate. In fact, in the third quarter of 2012, the Spanish labor force participation rate rose as high as 60.1% (over 23.1 mill. people). As is well-known, the crisis can trigger two opposite phenomena in relation to labor force participation rates: on the one hand, people who want a job give up the search due to the lack of job offers (discouraged worker effect). On the other hand, in some households affected by unemployment, other family members decide to search for a job (added worker effect). In the third quarter of 2012, the former phenomenon primarily occurred among Spanish males (18700 decided to abandon the economically active population), whereas the added worker effect was noticed among females (6800 new females were looking for a job).

In this context, the aim of this paper is to provide further empirical evidence on the presence of discouraged and added worker effects, in order to understand and anticipate the scope and persistence of these phenomena in the Spanish economy. Congregado, Golpe and Van Stel (2011) provide evidence for a non-linear relation between unemployment and labor force participation, comprising of a dominant added worker effect below a certain threshold of unemployment, and no significant relation between the two variables above this threshold. The present study extends their analysis in two directions. First, Congregado et al. (2011) do not distinguish between men and women, whereas the crude data presented above clearly suggest different responses in labor force participation to rising unemployment rates for men and women. In the present paper we will analyse the relation between unemployment and labor force participation separately for men and women. Second, Congregado et al. (2011) use data up to and including 2008, thereby including only the first year of the current crisis. In this paper we use data up to and including 2012. Since unemployment in Spain rose with 12 percentage points between 2008 and 2012, the variation in the data is likely to be much higher when including these four extra crisis years, thereby facilitating an accurate analysis.

The literature on the cyclical behavior of the labor force participation tends to find mixed results, where some studies find evidence for cyclical behaviour (either pro-cyclical or counter-cyclical) and others do not (see Congregado et al., 2011, for an overview). A possible explanation of these ambiguous results could be the existence of asymmetries, i.e., a statistical relation between unemployment and labor force participation that varies by time period, by gender, or both.

We test the discouraged/added worker hypotheses allowing for the possibility of a nonlinear long-run relationship between unemployment and labor force participation that varies by time period and/or by gender, using strategies to estimate nonlinear relationships which are in line with recent empirical literature (e.g., Benati, 2001;

[6] *The Euro Area average was 10.7% in December.*

Altavilla, Garofalo and Vinci, 2005; Congregado et al., 2011). In particular, our empirical framework initially consists of a linear vector error-correction model (VECM) before employing non-linear econometric methodology. The data are quarterly observations drawn from the Spanish Labour Force Survey. The sample period covers the period 1976:3 to 2012:4.

We argue that asymmetries in the relationship between unemployment and labor force participation may be due to different relative magnitudes of the discouraged and added-worker effects for higher and lower levels of unemployment, and for males and females. We hypothesize that the added worker effect dominates when unemployment rates are relatively low (so that many people will still see chances to find paid employment; in other words, it still pays off to enter the labor force), while we hypothesize the discouraged worker effect to dominate at higher levels of unemployment. Regarding gender differences we expect the discouraged worker effect to be dominant for men and the added worker effect to be dominant for women. Males traditionally have more labor market experience, hence in times of heavy recession unemployed males (particularly long-lasting unemployed) strongly feel their chances to find a job are low, resulting in movements from unemployment to inactivity. On the other hand, females are traditionally not the main breadwinner in the household, hence when their husbands are faced with unemployment or even inactivity, they are inclined to enter the labor force in an attempt to complement the household income (Prieto and Rodríguez, 2000a, 2000b).

In sum, the aim of this paper is to provide further empirical evidence on these two opposite effects in order to understand, at least partially, the why and wherefore of the recent evolution of the Spanish labor force participation rate, while attempting to anticipate its future evolution. The extreme and persistent fluctuations in the Spanish unemployment rate make Spain a particularly suitable case to study the added and discouraged worker effects.

The paper is organized as follows. The next section describes and interprets developments in Spanish labor force participation in the last four decades. Section 3 describes the estimation methodology and discusses the results. Finally, section 4 concludes.

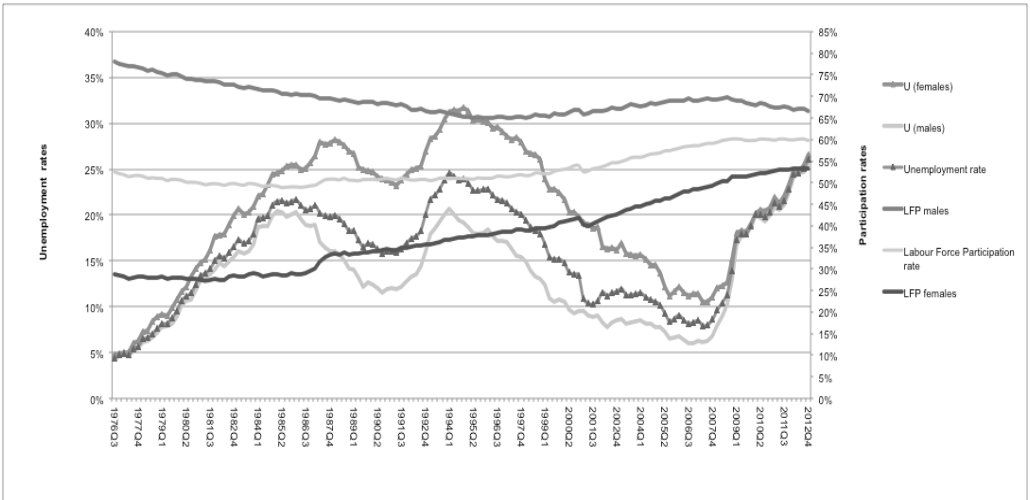
II. Unemployment and Labor Force Participation in Spain in the Last Four Decades

As we mentioned before, the Spanish labor market evolution has been characterized by extreme fluctuations. In fact, the high and persistent level in trend of the unemployment rate has been the most outstanding stylized fact describing the Spanish labor market (Dolado and Jimeno, 1997). The question is why unemployment growth in Spain is so intense and persistent? The most common explanation may be attributed to the basic framework of the Spanish economic relations.

The main feature of this framework is the low ability to reallocate labor between firms.[7] These characteristics of the institutional framework, together with a relatively large importance of the grey economy, may explain the persistently high level of unemployment in Spain, where unemployed have too little incentives to find employment and employers are not able to adapt to changing market conditions.

Figure 1

Spanish Participation Rate Evolutions, 1976:Q3-2012:Q4



Source: Instituto Nacional de Estadística (INE), Spanish Labor Force Survey.

Figure 1 shows the developments in the Spanish participation rate from 1976 to 2013. Apart from two exceptional sub-periods, the general picture is that of sustained rises in female participation rates matched with equally systematic falls in the male rates.[8] The male participation rate decreased until the second half of the 1990s, after which it began increasing again. The female rate increased over the whole period under consideration, and rose especially sharply until the current crisis. As a result, the aggregate participation rate seems to reveal a cyclical pattern.

Despite its exponential growth, female labor force participation rate in Spain was lower than in other European countries. However, the incorporation of new cohorts, the improvements in their educational attainment and the drop in fertility (Bover and Arellano, 1995) have led to a sustainable growth in the female participation rate,

[7] *Important institutional causes for this low ability include the high degree of employment protection corresponding to a low level of labor market flexibility; the importance of collective bargaining to establish employment conditions; the low level of functional and geographical mobility reinforced by the need to acquire court's approval for changing job's functional and geographic characteristics (García-Serrano and Jimeno, 1998; Dolado and Jimeno, 1997); and the generosity of the Spanish unemployment benefit system discouraging the search for employment (Blanchard and Jimeno, 1995,Toharia, 1997, Bover* et al.*, 2002).*

[8] *See Congregado et al. (2011) for a detailed description.*

although women's labor participation in Spain is still conditioned by their husbands' labor status (Prieto and Rodríguez, 2000a).

On the other hand, a key element to understand the heavy fall in the male labor force participation rate until 1995 was the declining participation among older men. This decline in their participation rate reflected a tendency towards early retirement. The decline in participation rates was substantial during the late 1970s and most part of 1980s for all the age groups over 50 years. Between 1977 and 1987 the participation rate declined by about 20 percentage points for those in their 60s and by 5 to 10 percentage points for those in their 50s (Ahn and Mira, 2000). The strong incentives to early retirement for low-skilled workers, as a way to combat the persistent and high unemployment rates, have been the most common interpretations of this phenomenon. However, since 1995 we observe a reversal of the trend of participation rates in Spain. In this sense, the business cycle could affect the individuals' participation and retirement decisions both directly and indirectly through its impact on the cyclical public policy variables, which alter the incentives to retire. In the current decade, the proportion of economically active people aged between 55 and 64 years has increased significantly, reaching 49% of the total economically active population in 2008 (Aragón et al., 2009). Nevertheless, non-participation due to early retirement remains an absorbing state for older men (Ahn and Mira, 2000).

Finally the heavy migration flow during the last expansion has had a decisive contribution to the growth of the aggregate participation rate. Migrants show higher participation rates than natives, as migrants are typically young people with lower reservation wages (Cuadrado et al., 2007).

III. The Econometric Framework and Results

The discouraged-worker hypothesis (effect) states that when opportunities of getting a wage-job are scarce, there will be many discouraged individuals who decide to leave or not enter the labor force.[9]

On the other hand, the added-worker hypothesis (effect) maintains that when economic conditions worsen, many secondary workers who are not currently in the labor market may decide to join the labor force. That is, when unemployment increases, some secondary workers such as students or females in dependence of a main breadwinner, faced by a household income fall, will decide to participate. Whether, on balance, the labor force participation rate will increase or decrease will depend on the relative strengths of the added-worker and discouraged-worker effects. Therefore, the net effect should be derived empirically, using time series. Our approach consists in analyzing the relationship between the labor participation rate and the employment rate, looking for linear cointegration relationships. In that sense, our benchmark model is a finite-order VAR of the following form:

[9] *Obviously, strong employment growth has the opposite effect (encouraged worker effect) and tends to attract individuals into the labor force, as the probability of obtaining employment is seen as improving.*

$$x_t = c + \sum_{i=1}^{k} A_i x_{t-i} + \varepsilon_t \tag{1}$$

where: $x_t = [p_t, e_t]'$ is a vector of non-stationary variables containing the labor force participation rate (p_t) and the employment rate (e_t), A_i is a *2x2* matrix of parameters, and ε_t is an *2x1* vector of residuals[10]. In order to characterize the long run dynamic adjustments, we can rewrite the equilibrium VAR model as a vector error correction model (VECM). The VAR(*k*) model can be rewritten in its VECM representation by subtracting x_{t-1} from the left and right hand sides:

$$\begin{aligned}
&\Delta x_t = c + (A_1 - I)x_{t-1} + ... + A_k x_{t-k} + \varepsilon_t = \\
&= c + (A_1 - I)x_{t-1} - (A_1 - I)x_{t-2} + (A_1 - I)x_{t-2} + A_2 x_{t-2} + ... + A_k x_{t-k} + \varepsilon_t = \\
&= c + \underbrace{(A_1 - I)x_{t-1} - (A_1 - I)x_{t-2}}_{(A_1 - I)\Delta x_{t-1}} + (A_1 - I)x_{t-2} + A_2 x_{t-2} + ... + A_k x_{t-k} + \varepsilon_t = \\
&= c + (A_1 - I)\Delta x_{t-1} + (A_1 + A_2 - I)\Delta x_{t-2} + ... + A_k x_{t-k} + \varepsilon_t
\end{aligned}$$

Hence,

$$\Delta x_t = c + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + \Pi x_{t-k} + \varepsilon_t \tag{2}$$

where: $\Gamma_i = -\left(I - \sum_{i=1}^{k-1} A_i\right)$ and $\Pi = -\left(I - \sum_{i=1}^{k} A_i\right)$. The matrix Π, is usually decomposed as $\Pi = \alpha\beta'$, where α and β are nxr matrices containing the adjustment coefficients and the cointegrating vector, respectively, *n* is the number of variables, *r* is the number of cointegrating relationships. The symbol Δ in equation (2) is the first difference operator. In this form, all terms in equation (2) are stationary, that is, integrated of order zero. In our application, the system can be written as:

$$\begin{bmatrix} \Delta p_t \\ \Delta e_t \end{bmatrix} = \Gamma(L)\begin{bmatrix} \Delta p_{t-i} \\ \Delta e_{t-i} \end{bmatrix} + \begin{bmatrix} \alpha_p \\ \alpha_e \end{bmatrix}(p_{t-1} - \beta e_{t-1}) + \begin{bmatrix} u_t^p \\ u_t^e \end{bmatrix} \tag{3}$$

where: α_p and α_e indicate the speed of adjustment of each variable back to its long-run value.

[10] *Let us define the employment rate* (e_t) *as the employment to population (aged 16+) ratio, the unemployment rate* (u_t) *as the unemployment to population (aged 16+) ratio, while the labor participation rate* (p_t) *consists of the economically active population as a percentage of the population (age +16). The relation between the rates defined above is given by the two following identities:* $e_t + u_t = p_t$ *and* $u_t = p_t - e_t$.

In the above model, the lagged residuals from the cointegrating vector act as an error correction term. This term, $p_{t-1} - \beta e_{t-1}$, captures the extent of disequilibrium for the system of variables with respect to the long-run relation between all variables in the system. The α parameters in each individual equation indicate the speed of adjustment of this variable back to its long-run value. A significant error correction term (i.e. a significant α parameter) implies long-run causality from the explanatory variables to the dependent variable under consideration.

Table 1

Linear VECM Estimates Participation-Employment, by Gender

Variables	Males		Females	
	Δp_t	Δe_t	Δp_t	Δe_t
c	-0.001*** (0.000)	-0.000 (0.000)	0.001*** (0.000)	0.001* (0.000)
Δp_{t-1}	-0.155* (0.084)	-0.399*** (0.139)	0.176* (0.091)	-0.103 (0.089)
Δp_{t-2}	-0.185** (0.086)	-0.145 (0.142)		
Δp_{t-3}	-0.018 (0.088)	0.158 (0.146)		
Δp_{t-4}	0.343*** (0.088)	0.372*** (0.145)		
Δe_{t-1}	0.078 (0.053)	0.579*** (0.087)	0.066 (0.085)	0.537*** (0.082)
Δe_{t-2}	-0.022 (0.060)	-0.174* (0.099)		
Δe_{t-3}	-0.040 (0.057)	0.271*** (0.095)		
Δe_{t-4}	0.112** (0.055)	0.323*** (0.090)		
α	-0.033*** (0.013)	0.040* (0.020)	-0.003 (0.002)	0.001 (0.002)

Standard errors are between parentheses. N
*, **,*** Significant at the 10%, 5% and 1%, respectively

Specifically, in the participation rate equation the error correction term $\left(\alpha_p\right)$ is not significant for the female specification. By contrast, this term is significantly different from zero for the male specification, meaning that a negative shock in the male unemployment rate in one quarter produces downward pressure on the participation rate in the subsequent quarter to restore the long-run equilibrium –evidence of a discouraged effect among the males. According to these results, should be rejected the existence of a relationship between participation and employment rates for females?

The response to this answer should be negative. Indeed, there is no reason for supposing a symmetrical relationship, as a prior. As mentioned above, it is possible that the discouraged/added worker effect for females is time-varying.

We then account for nonlinearity by applying a threshold cointegration. The concept of threshold cointegration characterizes a discrete adjustment, in a way in which the cointegration relationship between a set of variables only exists in a certain range, but holds if the system gets too far from the equilibrium. Hansen and Seo (2002) provide a vector error-correction model (VECM) in which exist a cointegration relationship between both variables and a threshold effect as an error correction term. As an extension of model (3), a two-regime threshold cointegration, or a nonlinear VECM model takes the form:

$$\begin{bmatrix}\Delta p_t\\ \Delta e_t\end{bmatrix}=\Gamma(L)\begin{bmatrix}\Delta p_{t-1}\\ \Delta e_{t-1}\end{bmatrix}+\begin{bmatrix}\alpha_p\\ \alpha_e\end{bmatrix}(p_{t-1}-\beta e_{t-1})+\begin{bmatrix}u_t^p\\ u_t^e\end{bmatrix}\ with\ (p_{t-1}-\beta e_{t-1})\le\gamma$$

$$\begin{bmatrix}\Delta p_t\\ \Delta e_t\end{bmatrix}=\Gamma'(L)\begin{bmatrix}\Delta p_{t-1}\\ \Delta e_{t-1}\end{bmatrix}+\begin{bmatrix}\alpha'_p\\ \alpha'_p\end{bmatrix}(p_{t-1}-\beta e_{t-1})+\begin{bmatrix}v_t^p\\ v_t^e\end{bmatrix}\ with\ (p_{t-1}-\beta e_{t-1})>\gamma \quad (4)$$

Moreover, Hansen and Seo (2002) propose a heteroskedastic-consistent Lagrange multiplier (LM) test statistics for the null hypothesis of linear cointegration (i.e., there is no threshold effect), against the alternative of threshold cointegration (i.e., model 4). The results of the test are reported in Table 2. Threshold cointegration for females would appear at the 5% and 10% significance level, for the fixed regressor and for the residual bootstrap, respectively, when β is fixed, so that the null hypothesis of linear cointegration would be strongly rejected, in both cases.

Table 2

Hansen-Seo Tests of Threshold Cointegration

Variables	Males	Females
	$\sup LM^0$	
Cointegrating vector	1	1
Threshold parameter	0.1142	0.0807
Test statistic	33.585	18.954
Fixed regressor p-value	0.104	0.038
Residual Bootstrap p-value	0.113	0.058

The estimated threshold for females is $\gamma=0.807$ with the error correction term defined as $\gamma_{t-1}=p_{t-1}-e_{t-1}$. Hence, the first regime (including 52.08% of the observations) would occur when the female employment rate is less than 8.07 percentage points above the participation rate; in other words, when the gap (unemployment rate) is below 8.07%. In turn, the second regime (with 47.92% of the observations) would occur when the gap is above 8.07%. The corresponding two-regime threshold VECMs for females are given below.

Table 3

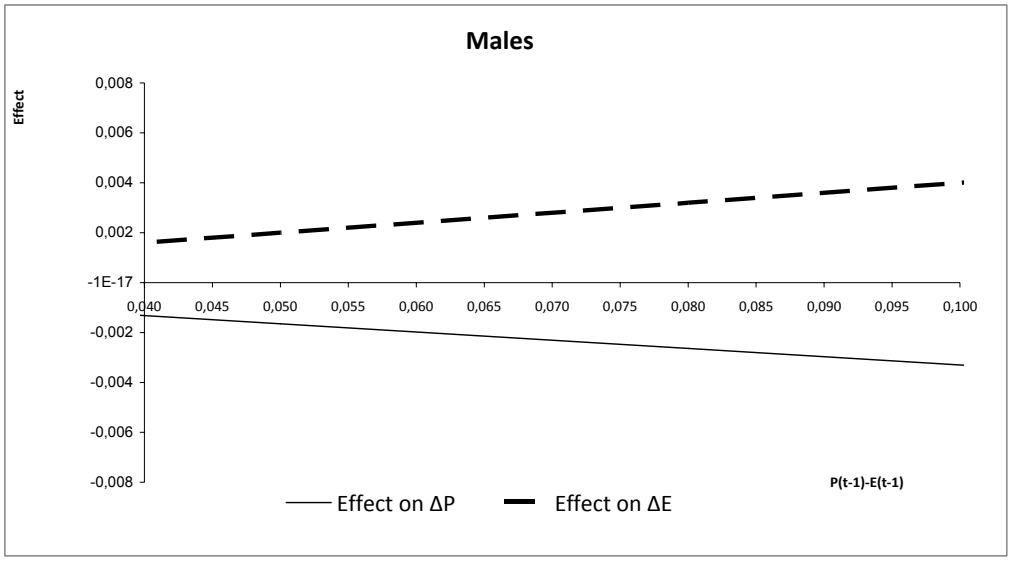
Threshold VECM Estimates (Hansen & Seo Approach)

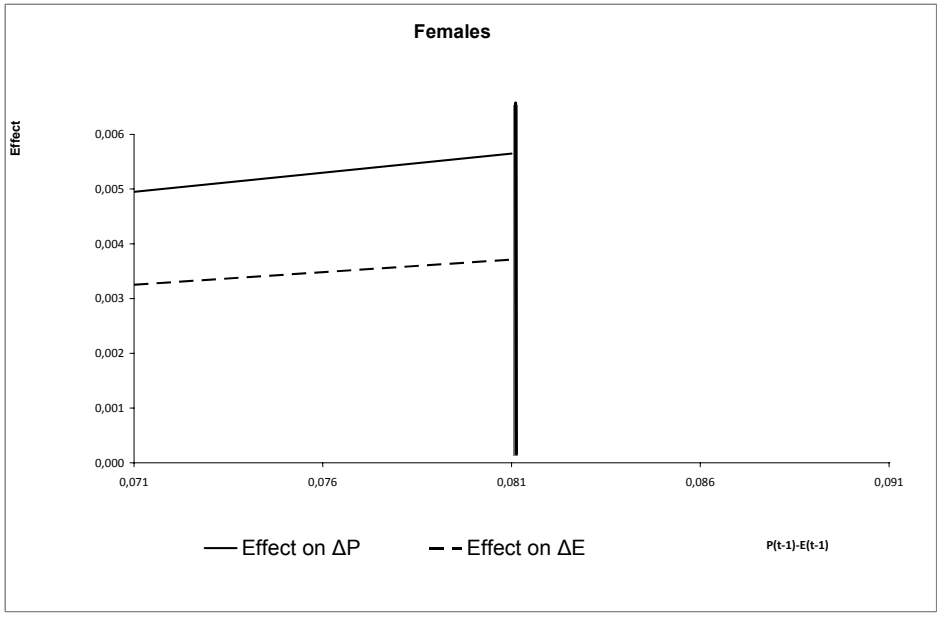
Regime defined by	$\hat{\gamma} \leq 0.0807$		$\hat{\gamma} > 0.0807$	
Variable	Δp_t	Δe_t	Δp_t	Δe_t
c	-0.002* (0.001)	-0.002* (0.001)	0.000 (0.003)	0.005* (0.003)
Δp_{t-1}	0.085 (0.090)	-0.212 (0.186)	0.232 (0.167)	-0.056 (0.147)
Δe_{t-1}	0.098 (0.138)	0.621*** (0.203)	-0.027 (0.082)	0.358*** (0.131)
α	0.070*** (0.025)	0.046** (0.023)	0.011 (0.028)	-0.040 (0.027)
Observations percentage:	52.08%		47,92%	

Standard errors are between parentheses. *, **,*** Significant at the 10%, 5% and 1%, respectively.

The estimation of the error-correction term, allow us inquire into the nature of the gap between labor force participation and employment rates. For the participation rate equation, the adjustment coefficient $\left(\alpha_p\right)$ is significantly different from zero. For females, when the unemployment rate is below 8.07% in one quarter produces upward pressure on the participation rate in the subsequent quarter to restore the long-run equilibrium. Therefore, data provide evidence in favor of an added worker effect for females. By contrast, for males the error-correction term in the participation rate equation was negative –and linear- (Table 1), a signal of a discouraged worker effect. Figure 2 plots the error-correction effect, i.e., the estimated response of (changes in) the participation rate (Δp_t) and the employment rate (Δe_t) to the discrepancy between them (i.e., to the unemployment rate) in the previous period, holding the other variables constant. As one may see, for a 'low' women's unemployment rate (i.e., lower than 8.07%), the effect on the participation rate is positive. The latter findings are consistent with the added worker hypothesis, which can be seen to be valid only for low unemployment rates, while the discouraged effect is observable for males.

Figure 2
Response of Participation and Employment Rates to Error Correction (P-E)



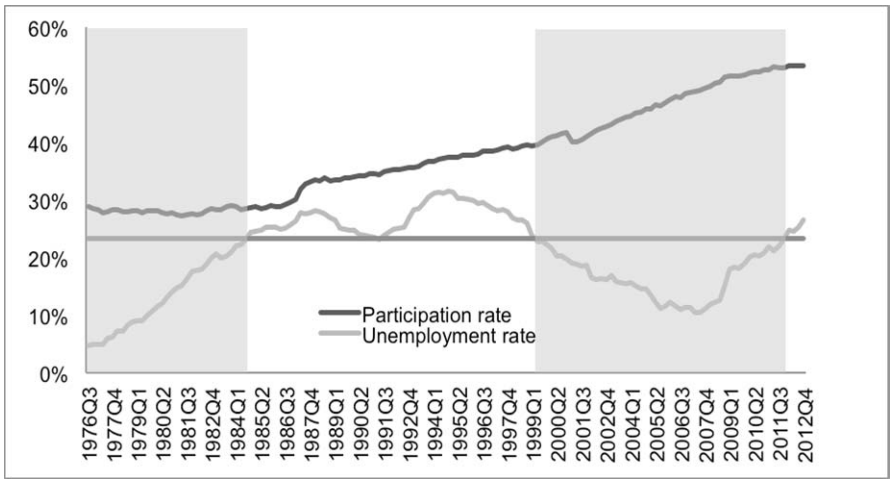


In sum, according to our results, the null hypothesis of linear cointegration is not rejected for males, and rejected in favor of a two-regime threshold cointegration model for females. For females, we provided evidence of a cointegrating relationship only when the unemployment rate is below 8.07%. This first regime, the relatively usual regime, is coincident with the lower unemployment levels during the period, as one

can see in Figure 3. This figure shows the 'equivalent' female unemployment rate threshold (u_t), based on the official unemployment data[11] (23.45%) where shadowed areas correspond to the first regime, in which an added worker effect operates for Spanish females. The figure also illustrates the recent jump in the female labor participation rate and indicates that the added worker effect among the Spanish females won't persist because the threshold has been reached, given the abrupt growth of unemployment among Spanish females workers. Therefore, the expected upturn in Spanish unemployment rates for 2013 and 2014 will not be coupled with new increases in the labour force participation rates, since only a weak discouraged effect will operate among Spanish males. [12]

Figure 3

Labour Market Evolution (Females), 1976:Q3-2012-Q4: Regimes and Thershold



IV. Conclusions

This paper has produced empirical evidence supporting the discouraged/added worker effect in Spain, namely the idea that groups of workers have a tendency to

[11] *Since we defined unemployment rate as the unemployment to population (aged 16+) ratio, and the official unemployment rates is defined in terms of economically active population, the 8.07% unemployment rate threshold for females (1991:Q2) corresponds to an official female unemployment rate of 23.45 percentage points.*

[12] *Prieto and Rodriguez (2000a) using Spanish micro data found that the discouraged worker effect will exist only for males, whereas the relationship for females will be dominated by an added worker effect. Using European micro data of married women, Prieto and Rodríguez (2000b) find that female labor market participation continues to have a 'secondary' role in the family sphere. For Spain, as well as some other European countries, these authors find that it is inactivity of the husband, rather than unemployment, which stimulates the women's labor supply. Finally, Congregado* et al. *(2011) provide evidence of an added worker effect during the first year of the current crisis.*

move in and out of the labor force with the business cycle. Our estimates reflect exactly the recent observed evolution in the Spanish participation rates and suggest that female participation rate will still be higher in the future, whereas the male participation rate has suffered a change in trend. Since there will be many discouraged males, who decided not to enter the labor force, improving say their education, in the hope of better future job opportunities, the net result on the labor force participation rate will depend of the intensity of both opposite effects[13]. In sum, the results suggest that an equilibrium-distorting shock will have two opposite effects on the participation rate dynamics behavior depending on the gender.

References

Ahn, N. and Mira, P., 2000. Labor Force Participation and Retirement of Spanish Older Men: Trends and Prospects, *FEDEA Documento de Trabajo*, 2000-25.

Altavilla, C., Garofalo, A. and Vinci, C.P. ,2005. Is the discouraged worker effect time-varying?, *CELPE Discussion Paper* 97, University of Salerno, Italy.

Aragón, J., Cruces, J., de la Fuente, L. and Rocha, F., 2009. La situación de las personas de 55 a 64 años en relación al mercado de trabajo y sus trayectorias laborales, *Estudios de la Fundación*, No.5/2009, Fundación 1º de mayo.

Balke, N.S. and Fomby, T.B., 1997. Threshold cointegration, *International Economic Review*, 38, pp. 627-45.

Benati, L., 2001. Some empirical evidence on the 'discouraged worker' effect, *Economics Letters*, 70 (3), pp. 387-95.

Bentolila, S. and Jimeno, J.F., 2003. Spanish unemployment: the end of the wild ride?, *FEDEA Documento de trabajo* 2003-10, April, 2003.

Blanchard, O. and Jimeno, J.F., 1995. Structural unemployment: Spain and Portugal, *American Economic Review*, 85, pp. 212-218.

Bover, O. and Arellano, M., 1995. Female labour force participation in the 1980s. The case of Spain, *Investigaciones Económicas,* 19 (2), pp. 171-194.

Bover, O., Arellano, M. and Bentolila, S., 2002. Unemployment duration, benefit duration and the business cycle, *Economic Journal*, 112, pp. 223-265.

Clark, K.B. and Summers, L.H., 1981. Demographic differences in cyclical employment variation, *Journal of Human Resources*, 16, pp. 61–79.

Clark, K.B. and Summers, L.H., 1982. Labor force participation: Timing and persistence, *Review of Economic Studies*, 49 (5), pp. 825-44.

Congregado, E. and García-Pérez, J.I., 2002. Análisis económico de la reciente reforma del sistema de prestaciones por desempleo, *Cuadernos de Información Económica*, 169, pp. 105-116.

[13] *Finally, Congregado* et al. *(2011) provide evidence of an added worker effect during the first year of the current crisis.*

Congregado, E., Golpe A.A. and van Stel, A., 2011. Exploring the big jump in the Spanish unemployment rate: Evidence on an 'added-worker' effect. *Economic Modelling*, 28, pp. 1099-1105.

Cuadrado, P., Lacuesta, A., Martínez J.M. and Pérez, E., 2007. El futuro de la tasa de actividad española: Un enfoque generacional. *Documentos de Trabajo*, Banco de España No. 0732, 2007.

Darby, J., Hart, R.A. and Vecchi, M., 2001. Labour force participation and the business cycle: A comparative analysis of France, Japan, Sweden and the United States, *Japan and the World Economy*, 13, pp. 113-133.

Dolado, J.J. and Jimeno, J.F, 1997. The causes of Spanish unemployment: A structural VAR approach, *European Economic Review*, 41, pp. 1281-1307.

Eurostat, 2011. Eurostat New Release, *Euroindicators*, 124/2011. Available in http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/3-31082011-BP/EN/3-31082011-BP-EN.PDF

García-Pérez, J.I., 1997. Las tasas de salida del empleo y del desempleo en España (1978-1993). *Investigaciones Económicas*, XXI(1), pp.29-53.

García-Serrano, C. and Jimeno, J.F., 1998. Labour reallocation, job tenure, labour flows and labour market institutions: Evidence from Spain. *FEDEA Documento de trabajo* pp.98-07.

Goodman, J.L. Jr., 1974. Spectral analysis of the dependence of labor force participation on unemployment and wages, *Review of Economics and Statistics*, 56, pp.390-393.

Hansen, B.E. 1999. Testing linearity, *Journal of Economic Surveys*, 13, pp.551-576.

Hansen, B.E. and Seo, B., 2002. Testing for two-regime threshold cointegration in vector error-correction models, *Journal of Econometrics*, 110, pp.293-318.

I.N.E., 2009. *Spanish Labour Force Survey*. Instituto Nacional de Estadística.

Johansen, S., 1988. Statistical analysis of cointegration vectors, *Journal of Economic Dynamics and Control*, 12 (2), pp.231-54.

Johansen, S., 1991. Estimation and hypothesis testing of cointegrated vectors in Gaussian vector autoregressive models, *Econometrica*, 59, pp.1551-80.

Kugler, A., Jimeno, J.F. and Hernanz, V., 2002. Employment Consequences of Restrictive Permanent Contracts: Evidence from Spanish Labor Market Reforms. *IZA Discussion Papers*, 657, Institute for the Study of Labor (IZA).

Lo, M. C., and Zivot, E., 2001. Threshold cointegration and nonlinear adjustment to the law of one price, *Macroeconomic Dynamics*, 5 (4), pp.533-576.

Long, C., 1953. Impact of effective demand on the labour supply, *American Economic Review, Papers and Proceedings,* 43, pp.458-467.

Mincer, J., 1966. Labor-force participation and unemployment: a review of recent evidence, in: Gordon, R.A. and M.S. Gordon (Eds.), *Prosperity and Unemployment*, New York: Wiley.

Ng, S. and Perron, P., 2001. Lag length selection and the construction of unit root tests with good size and power, *Econometrica*, 69, pp.1529-54.

OECD, 1994. *The OECD Jobs Study*. Paris: OECD.

Prieto, J. and Rodríguez C., 2000a. The added worker effect in the Spanish case, *Applied Economics*, 32, pp.1917-1925.

Prieto, J. and Rodríguez, C., 2000b. Participation of married women in the labour marker and the added worker effect in Europe, *IRISS Working Paper Series*, No. 2000-12.

Tella, A., 1964. The relation of labor force to employment, *Industrial and Labor Relations Review*, 17, pp.454-69.

Toharia, L., 1997. El sistema español de protección por desempleo, *Papeles de Economía Española*, 72, pp.192-213.

Toharia, L., 2003. El mercado de trabajo en España, 1978-2003, *ICE*, 811, 203-220.

Verheul, I. van Stel, A., Thurik, R. and Urbano, D., 2006. The relationship between business ownership and unemployment in Spain: A matter of quantity or quality?, *Estudios de Economía Aplicada*, 24, pp.435-457.