Philip Arestis

University of Cambridge,
UK
✉ pa267@cam.ac.uk

**Ana Rosa
González-Martínez**

Cambridge Econometrics,
UK
✉ agm@camecon.com

Paper by invitation

Is Job Insecurity a Driver of the Housing Cycle? Some Evidence in the Spanish Case

Summary: The aim of this paper is to study a possible connection between the characteristics of the labour market, namely, employment protection and flexibility, and the dynamics of the housing market. More specifically, this contribution analyses whether the poor quality of employment in a given economy could cause the collapse of the housing market and impairs its recovery. In the second stage of our analysis, we provide estimates for Spain over the period 1984-2014. In doing so, the autoregressive distributed lag (ARDL) bounds test for cointegration is employed.

Key words: Labour market, Housing cycle, Residential investment, Cointegration techniques, Spain.

JEL: C22, R31.

Several episodes of housing bubbles occurred in the last decade across different economies, e.g. the US, the UK, Spain, etc… However, the response of the housing market, and subsequently, the behaviour of the rest of the economy have been quite different in each case. The Spanish case could be considered as the most extreme one in view of the subsequent collapse of the labour market, which seven years later is still exhibiting unemployment rates above 23%. In terms of the relationship between these two markets, economists have only focused on providing some evidence of how homeownership contributes to increase unemployment *via* reducing labour mobility. However, there is no study, which responds to the question of whether the institutional set up of the labour market could contribute to mitigate the housing cycle, and subsequently, the business cycle.

In this context, we need to explore whether the level of employment protection and other characteristics of the labour market could affect the size and duration of the downturn of the market. Economists could argue that countries, which are characterised by low employment protection and high flexibility, present stronger cycles since this could accelerate job destruction after the collapse and exacerbate the downturn of the market. From a mainstream perspective, high flexibility could lead to a quicker recovery, i.e. it shortens the duration of the downturn. However, this kind of propositions are more controversial than they seem to be at first sight in view of the role, which aggregate demand and income can play in the evolution of the economy.

As far as we are concerned the relationship between housing and labour markets has been only explored in order to assess a possible contribution of homeowner-

ship to the development of unemployment (David G. Blanchflower and Andrew J. Oswald 2013; Jani-Petri Laamanen 2013). However, there is a gap in the existing literature in terms of studying the presence of pro-cyclical effects on the housing market, which emanates from the labour market at the macro level. This paper is a pioneering one in its field since there is no contribution that focuses on how the institutional set up of the labour market can affect residential investment.

In the second stage of our analysis, we proceed to test the theoretical relationship put forward by means of the autoregressive distributed lag (ARDL) bounds test for cointegration. This econometric technique is applied to obtain some empirical evidence in the case of Spain over the period 1984-2014.

The layout of this contribution is organised as follows. Section 1 presents our conceptual framework. Sections 2 and 3 elaborate on the econometric technique and the data, which have been employed to test our conceptual framework. Section 4 refers to some empirical evidence, which has motivated this study. Section 5 focuses on our empirical results. Finally, Section 6 summarises and concludes.

1. Conceptual Framework

For the purpose of this paper, we assume an economy characterised by "cheap" dismissals, i.e. an economy where employment protection is low. Under such circumstances, we can hypothesise that entrepreneurs will dismiss some of their workers as soon as they perceive a decline in their demand, which is maintained for a few months. Low skilled and young workers who can be easily replaced during the recovery would be the first ones to be dismissed. Those who get into debt to become first time home buyers would struggle to repay their debts. Eventually, this would end up in an episode of foreclosures and evictions. If this phenomenon is strong enough commercial banks would be forced to sell these properties below the market price in an attempt to balance their assets. This would accelerate the decline of house prices and curb the volume of new developments. The effects of the decline of one of the components of aggregate demand would spread to the rest the economy in view of the Keynesian multiplier. In the next iteration, lower aggregate demand would provoke another "wave" of dismissals, which would exacerbate the downturn and impact negatively on the demand for housing and residential investment.

In order to assess whether that mechanism was operating to "catalyse" the downturn of the housing market and impair its recovery after the last wave of "bubbles", which happened in some developed economies in 2007-2008, we propose a conceptual framework that is rooted in Philip Arestis and Ana R. González-Martínez (2014). The latter study concentrates on a variable, which traditionally has played a crucial role in the recovery of the market, i.e. real residential investment. The study of this variable is relevant for our purposes, since investment in dwellings can be considered as a proxy of the level of activity of the housing market. More specifically, Arestis and González-Martínez (2014) summarise the dynamics of the housing market by means of two equations, namely, demand for and supply of housing. In this theoretical framework, the demand for housing is defined as a function of house prices, real disposable income, mortgage rates, the volume of credit to the private sector and unemployment; while the supply of housing is a positive function of house

prices and real residential investment. Subsequently, it is assumed that the model is in equilibrium that allows to set both relationships equal to each other and to solve the relevant equation with respect to real residential investment. The resulting relationship suggests that residential investment is positively related to house prices, disposable income and the volume of credit; while it is negatively influenced by the rate of interest of loans for housing and the rate of unemployment.

In terms of this paper, two variables which are discussed extensively in Arestis and González-Martínez (2014) are extremely relevant, i.e. real disposable income and unemployment. The former is a key element to determine housing affordability, while the latter is an indicator of the level of activity of the labour market and also a proxy for uncertainty. Considering a theoretical framework along the lines described above, it is sensible to assume that the institutional set up of the labour market, which affects unemployment (Giuseppe Bertola, Tito Boeri, and Sandrine Cazes 1999; Pierre Cahuc and Fabien Postel-Vinay 2002), could eventually affect negatively the demand for housing through different channels: (i) job insecurity discourages the formation of new households (Sascha O. Becker et al. 2010), which curbs the demand for housing; (ii) job precariousness impairs homeownership in a context of strong macroprudential policy (see Janet Ford 1998 for further discussion of the relationship between job insecurity and home ownership); (iii) a removal of the existing employment protection would accelerate job destruction (see EL PAÍS 2014 for some evidence in the Spanish case after the reform implemented in 2012), which could lead the housing market to shorter and deeper cycles, as explained in the introduction. Some light on this issue is needed to provide policy makers with another "tool" to intervene in the market, and prevent them to increase "flexibility" in the labour market at the "wrong" moment.

Moving on to the characterisation of the institutional set up of the labour market, we propose to account for the following features of the labour market: (a) share of full-time equivalent (FTE) employment over total employment; (b) an indicator which refers to employment protection legislation and captures the procedures and costs involved in dismissing individuals or groups of workers; (c) another indicator which refers to employment protection legislation and accounts for the procedures involved in hiring workers on fixed-term or temporary work agency contracts.

The last two items are covered by the Organisation for Economic Co-operation and Development (OECD) Employment database (OECD 2013). On the one hand, the "Strictness of employment protection - individual and collective dismissals (regular contracts)" indicator accounts for: (1) procedural inconveniences that employers face when starting the dismissal process, such as notification and consultation requirements; (2) notice periods and severance pay, which typically vary by tenure of the employee; (3) difficulty of dismissal, as determined by the circumstances in which it is possible to dismiss workers, as well as the repercussions for the employer in the event that a dismissal is found to be unfair. On the other hand, the "Strictness of employment protection - temporary contracts" is computed by taking into account information related to the types of work for which fixed-term contracts are permitted; also their length, existing legislation about the establishment and operation of temporary work agencies and requirements for agency workers to receive the

same pay and/or conditions as equivalent workers in the user firm, which could eventually increase the cost of using temporary agency workers relative to hiring workers on permanent basis.

Our contribution suggests that a removal of employment protection as defined by the "Strictness of employment protection - individual and collective dismissals (regular contracts)" indicator will affect negatively the demand for housing, and subsequently, households' investment in housing assets. This negative effect feeds through two different channels. On the one hand, we can expect a change in individuals' behaviour who will take their decisions regarding investment on housing in an environment characterised by a higher degree of uncertainty. This will depress potential demand for housing, since some individuals that are employed in precarious jobs would opt for renting their properties rather than getting into the housing market as home owners. This negative effect, which emanates from rising uncertainty, would also affect commercial banks' behaviour. More specifically, tightening the eligibility criteria to get into debt is expected, which curbs effective demand for housing, and eventually affects real residential investment. On the other hand, another dimension, which would be affected by the removal of employment protection is income, *via* the severance pay that is obtained by unemployed following their dismissal. A reduction of the amount, which is perceived as severance pay, would compromise the financial solvency of some households who would be unable to meet their financial obligations. This would contribute to an increase in foreclosures and evictions that accelerate the downturn of the housing market.

Moreover, we can expect that those changes in the existing body of legislation, which favour the demand for labour, and eventually increase employment, would increase disposable income. Rising income improves housing affordability as has been discussed extensively by James M. Poterba (1984), OECD (2005), and Luca Gattini and Ioannis Ganoulis (2012). In terms of our conceptual framework, this type of change in the existing body of regulation would be measured by the "Strictness of employment protection - temporary contracts" indicator. We may note that the type of employment creation, to which this index refers, is not a high quality one. This is so since what is promoted with this type of measures is employment on fixed-terms basis during longer periods. This type of hiring has further implications in terms of the housing market. We can expect a positive indirect effect on real residential investment, which emanates from an increase in the demand for housing under a rental regime. This is so since those individuals who have fixed-term contracts would not be qualified to obtain those financial resources, which are required to move on and climb the property "ladder". However, this would create an incentive for individuals who are more solvent to invest in the property market in view of the mentioned expansion of the rental market.

Apart from that there is an additional effect, which emanates from an increase in employment protection. We refer to the positive relationship between employment protection and productivity as highlighted by Giulio Fella (2005) and Michèle Belot, Jan Boone, and Jan C. van Ours (2007). When rising productivity affects positively disposable income, this would further enhance the loop "income-demand for housing-residential investment".

Furthermore, our approach to categorise the institutional set up of the labour market accounts for the evolution of full-time employment. More specifically, we propose the inclusion of the ratio "full-time employment-to-total employment", which permits us to build a proxy to measure job quality in general terms. It is sensible to assume that low quality jobs are more sensitive to the business cycle (see, also, William Mitchell, Jenny Myers, and James Juniper 2005, for further discussion and empirical evidence of the dynamics of the full-time and part-time jobs during the business cycle). In other words, one might expect that part-time jobs are the first ones to disappear during the first stage of the recession, especially if they are associated with low-skilled job as has been happening traditionally in Spain (see, also, Sandalio Gómez 2014, for further details). That premise gives us a first intuition to assume that may be the case in which those economies where part-time jobs have a higher relative weight over total employment can exhibit, *ceteris paribus*, a deeper business cycle and deeper housing cycle as well. This phenomenon could be more relevant in terms of the labour market if part-time jobs are popular amongst young adults, who have found in this type of jobs the way to obtain their first working experience. In this context, we aim to explore the hypothesis that job destruction affects more severely part-time employment during the downturn, and impairs part-time workers to get on the property "ladder" and re-activate the market.

At this stage, we proceed to encapsulate the discussion above as shown in Equation (1):

$$i^h = i^h(ep^a, \ ep^b, \ r^{ft}, \ y^d)$$
$$\qquad\quad - \quad + \quad -/+ \quad +$$

(1)

where i^h accounts for real residential investment; ep^a is the "Strictness of employment protection - individual and collective dismissals (regular contracts)" indicator; ep^b refers to the "Strictness of employment protection - temporary contracts" indicator; r^{ft} denotes the ratio "full-time employment-to-total employment"; y^d stands for real disposable income. The sign below a variable indicates the partial derivative of the dependent variable with respect to that variable.

2. Econometric Technique

A preliminary step to the modelling exercise, which has been undertaken for the purpose of this paper, is to check for the order of integration of those time series that our sample comprises of. In doing so, the following tests are employed: (i) the Augmented Dickey-Fuller test (David A. Dickey and Wayne A. Fuller 1979, 1981); (ii) the Phillips-Perron test (Peter C. B. Phillips and Pierre Perron 1988); (iii) the GLS-based Dickey-Fuller test (Charles R. Nelson and Charles I. Plosser 1982); (iv) the Kwiatkowski-Phillips-Schmidt-Shin test (Denis Kwiatkowski et al. 1992); (v) the Lee and Strazicich's (Junsoo Lee and Mark C. Stazicich 2003) unit root test. The utilisation of the later prevents the researcher from assuming the wrong order of integration due to the existence of structural breaks in the data. The results of all these

tests suggest that our sample contains trend stationary and first-difference stationary variables[1].

In order to deal with the existence of variables which are I(0) and I(1), the ARDL bounds test for cointegration (Mohammad H. Pesaran, Yongcheol Shin, and Richard J. Smith 2001) is employed. In addition to that, Pesaran and Shin (1999) highlight the suitability of this technique in the case of small or finite sample sizes (see, also, Paresh K. Narayan 2005). Another important characteristic of this approach is the fact that all the variables involved in the estimation process are treated as endogenous elements, while the long-run and short-run parameters are estimated simultaneously. More specifically, the ARDL bounds testing approach implies the estimation of the conditional error correction model (ECM) shown in Equation (2):

$$\Delta i_t^h = \beta_0 + \beta_1 i_{t-1}^h + \beta_2 X_{t-1} + \sum_{i=1}^{n} \beta_i \Delta i_{t-i}^h + \sum_{j=0}^{m} \beta_j \Delta X_{t-j} + \varepsilon_t , \qquad (2)$$

where all the variables have the same meaning as in Equation (1), with the exemption of X, which is a vector that includes the two variants of the employment protection indicator, which are denoted as ep^a and ep^b respectively, the ratio "full-time employment-to-total employment", r^{ft}, and real disposable income, y^d; β_0, which is the intercept of the regression; ε, which is a vector of the error white noise process. The estimation of the mentioned error correction model is carried out by means of OLS.

We may also note that in the ARDL bounds test for cointegration framework a F-test is utilised to study a possible co-movement among the variables under scrutiny. In order to apply this test, two sets of critical values are employed (Pesaran, Shin, and Smith 2001): (a) the lower bound, which considers that all the time series are purely trend stationary; (b) the upper bound, which refers to the case where the variables are first-difference stationary, i.e. they contain a unit root. Cointegration is found when the F-statistics exceeds the upper bound. In order to select the appropriate lag length structure for the relevant error correction model the Schwarz Bayesian information criterion (SBC) is considered. We assume a maximum lag length of 3 periods as suggested by the relevant literature (Walter Enders 2004).

Finally, our econometric results are validated by means of of the following choice of tests: (1) the Breusch-Godfrey serial correlation LM statistic (Leslie G. Godfrey 1978; Trevor S. Breusch 1979), which tests for the lack of autocorrelation; (2) a test based on the regression of squared residuals, which checks for the absence of heteroskedasticity; (3) a normality test, which is based on the skewness and kurtosis of residuals. Moreover, the stability of the parameters, which have been estimated is checked by applying the CUSUM and the CUSUM of squares tests (Robert L. Brown, James Durbin, and James M. Evans 1975)[2].

Three econometric packages are required to carry out this analysis: GAUSS 10 to run the Lee and Strazicich's (2003) unit root test; EViews 8 to conduct other unit root/stationarity test and Microfit 4.1 to estimate the conditional ECM model.

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[1] The results of these tests are not reported but they are available from the authors upon request.
[2] The results of the CUSUM and the CUSUM of squares tests are not reported but they can be obtained from the authors upon request.

3. Data

In order to test our theoretical proposition we utilise annual data for Spain over the period 1984-2014. The temporal scope of our research is determined by the availability of relevant time series, as explained below.

More specifically, we employ data published by two different organisations. On the one hand, the OECD Employment database[3] is consulted. This databank is the source for the two indicators of employment protection that we have utilised, i.e. "Strictness of employment protection - individual and collective dismissals (regular contracts)" and "Strictness of employment protection - temporary contracts". On the other hand, the AMECO databank[4], which is maintained by the European Commission's Directorate General for Economic and Financial Affairs, is utilised. More specifically, the following time series are obtained from this data provider: (i) Gross national disposable income per head of population; (ii) Gross fixed capital formation at 2010 prices: dwellings; (iii) Price deflator domestic demand including stocks; (iv) Employment, full-time equivalents: total economy (National accounts); (v) Employment, persons: all domestic industries (National accounts).

At this stage we need to clarify that the data obtained from the OECD sources was extrapolated and extended to cover the period 1984-2014 since this data source ends in 2013. In doing so, the rate of growth of the first and last year available are utilised to obtain data for 1984 and 2014.

4. Key Figures: Spain (1984-2014)

To begin with, some stylised facts are presented in order to characterise the evolution of the Spanish labour market since 1984. Figure 1 shows the evolution of full-time and total employment over the period under consideration.

Figure 1 could be interpreted as a deterioration of the average quality of jobs in the Spanish labour market in view of a decline of the share of FTE over total employment in the last 30 years. Economists could also argue that an increase in part-time employment is not a negative phenomenon *per se*, since it could be the result of a "modernisation" of the labour market in order to provide better opportunities to reconcile working life and childcare to those female workers who wish to join this type of employment during a period of their life. However, it is very difficult to support that argument in the case of the economy under consideration, where female unemployment rate has been twice its male counterpart (OECD 2004; Olga Alonso-Villar and Coral del Río 2005). Additional evidence against that "optimistic" hypothesis is also provided by the high job insecurity for young women in the case of this economy (Marta Ibañez 2010).

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[3] **Organisation for Economic Co-operation and Development (OECD).** 2015. Employment Policies and Data. http://www.oecd.org/els/emp/onlineoecdemploymentdatabase.htm (accessed January 30, 2015).
[4] **European Commission (EC).** 2015. Annual Macro-Economic Database (AMECO). http://ec.europa.eu/economy_finance/db_indicators/ameco/index_en.htm (accessed January 30, 2015).
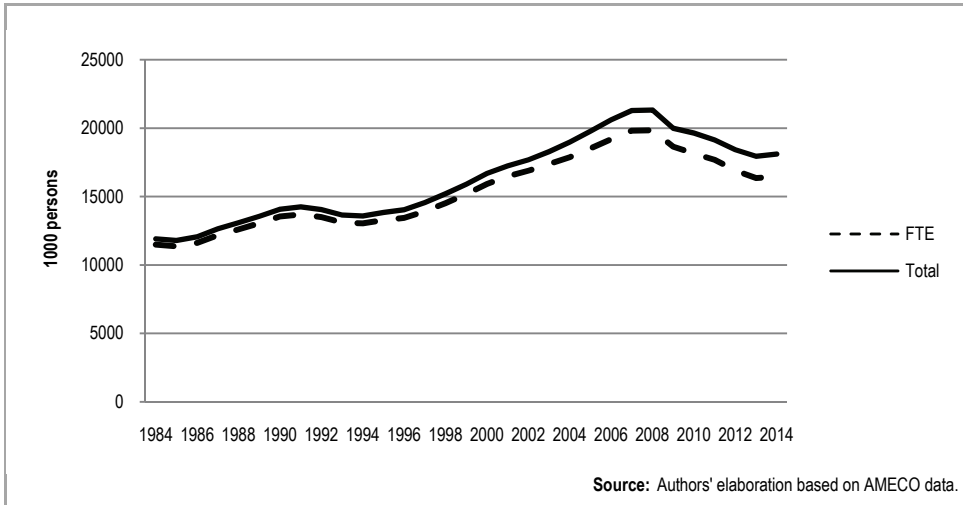
Figure 1 Evolution of Employment (1984-2014)

Moreover, we report the evolution of an additional set of variables: involuntary workers, short-term economic workers and discouraged workers to complete the "picture" of the Spanish labour market in the last three decades[5].
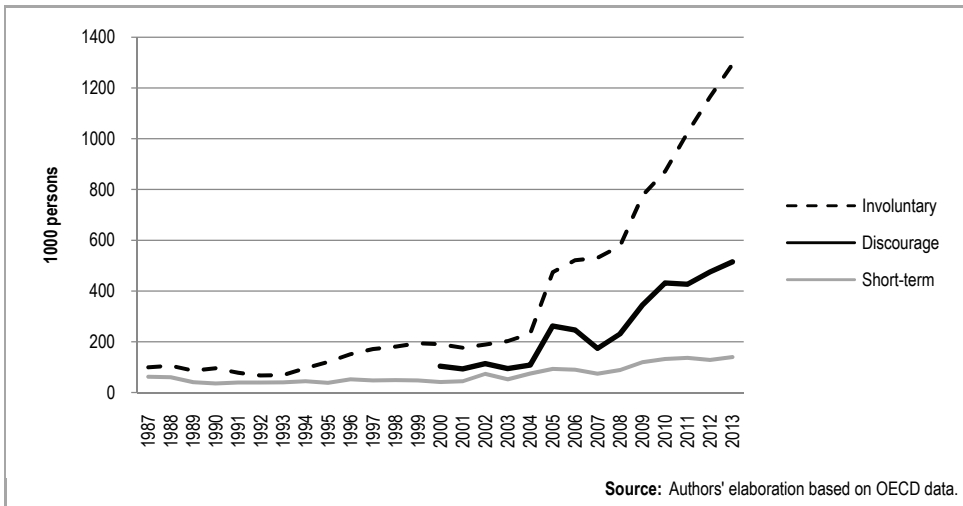

Figure 2 Involuntary Workers, Short-Term Economic Workers and Discourage Workers (1987-2013)

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[5] In addition to the econometric analysis, which is shown in Section 5, we have carried out some preliminary work that explores these variables; i.e. involuntary workers, short-term economic workers and discouraged workers. These are treated as possible indicators, which could be included in our econometric analysis to capture the characteristics of the labour market. However, weak evidence is found in the case of the explanatory power of these variables. The justification for undertaking this exercise is due to Arestis and González-Martínez (2014) who demonstrate a negative and strong relationship between unemployment and residential investment.

Figure 2 shows a dramatic increase in involuntary unemployment after 2004. That pattern accelerates in the aftermath of the collapse of the housing market which occurred in 2007. Figure 2 also shows how the evolution of discouraged workers reflects the path described by involuntary unemployment. Finally, another important variable which is reported in Figure 2, is the number of short-term economic workers. "Economic short-time workers" accounts for those workers who are working less than usual due to business slack, plant stoppage, or other technical reasons. Although the pattern followed by this variable prior to 2003 was quite stable, there is an increase in the number of workers that fall into this category after that date. The increase is quite intense after 2007 and pick up again after 2012. A first interpretation of these figures, suggests that the labour market could be impairing the recovery of the housing market, due to the existence of negative expectations regarding the future evolution of employment, and subsequently, income[6].

For the purposes of this paper the effects of the Spanish labour market reform, which took place in 2012 are not discussed since such discussion is beyond the scope of this paper. However, in terms of our conceptual framework, changes in the 2012-regulation along those lines should be considered as a "negative" phenomenon since some existing employment protection was removed after its implementation. In other words, the relaxation of some conditions for dismissals to happen have facilitated its occurrence and could have boosted the number of repossessions and evictions in the segment of workers whose dismissal would not have happened in the previous institutional set up. Unfortunately, the lack of specific data to test that hypothesis prevents us from drawing final and firm conclusions.

5. Empirical Results

Table 1 displays the results of the ARDL bounds testing approach for cointegration. We may note that all the variables are expressed in logarithms, which permits to interpret the estimated parameters as elasticities. The relevant set of tests, which validates our econometric model is also shown in Table 1.

Table 1   Bounds Test for Cointegration

	Autoregressive distributed lag estimates ARDL (2,1,2,0,1)
W-test	32.8168 [0.000]
Serial correlation	0.0330 [0.856]
Normality	4.6391 [0.098]
Heteroscedasticity	0.9736 [0.324]

Source: Authors' calculations.

Our econometric results suggest that a cointegration relationship to support our testable hypothesis is found at 1% significance level as indicated by the Wald test

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[6] See, also, Francisco Carballo-Cruz (2011) for a detailed description of the job destruction process, which took place in the Spanish economy after the burst of the housing bubble.

reported above. The conditional error correction model which is estimated for the purpose of this paper satisfies the hypothesis of normality, lack of autocorrelation and heteroskedasticity of the residuals.

Table 2 shows the estimated parameters of the long-run equilibrium model, along with the error correction model, which captures the dynamics of the variables in the short-run.

Table 2 Econometric Results (Spain, 1984-2014)

	Intercept	L_ep^a	L_ep^b	L_r^{ft}	L_i^d		
Long-run relationship	-3.6683	-1.0601*	4.1000***	-7.3583*	2.4510***		
	Intercept	ΔL_ep^a	ΔL_ep^b	ΔL_r^{ft}	ΔL_i^d	ΔL_i^h	EL_i^h
Short-run relationship	-1.1744	-0.03868(0)	0.37617(0)	-2.3558* (0)	2.9265*** (0)	0.3024** (1)	-0.3201***
				-0.56534*** (1)			

Note: *, ** and *** indicate statistical significance and rejection of the null at the 10 per cent, 5 per cent and 1 per cent significance levels respectively. Number of lag(s) is provided in the parenthesis.

Source: Authors' calculations.

To begin with the discussion of our results, we concentrate on the long-run equilibrium relationship. Our estimates have identified a positive elasticity, which emanates from real disposable income (2.45), i^d. Moreover, our results report a strong and negative elasticity, which emanates from changes in the ratio "full-time employment-to-total employment" (-7.35), r^{ft}. As has been discussed in our conceptual framework, we can expect a negative impact of that ratio on the demand for housing, and subsequently, on residential investment in those cases where the rise of that ratio responds to a decline in total employment while full-time employment is maintained stable or less affected by job destruction than part-time employment. This statement is perfectly applicable in the case of the Spanish labour market, which is a "dual" one, characterised by strong job precariousness for outsiders, along with a high level of employment protection, which is enjoyed by insiders (Maia Güel and Barbara Petrongolo 2007). In this context, it is fair to assume that job destruction has been confined to part-time and precarious employments, while it did not affect full-time employment in the same way.

Furthermore, our econometric analysis highlights some co-movement in the long run between the two indicators of employment protection and real residential investment. However, careful consideration needs to be given to the interpretation of these two elements of our model. On the one hand, the "Strictness of employment protection - individual and collective dismissals (regular contracts)" indicator, ep^a, which is included in our analysis, measures the strictness of regulation of individual dismissal of employees on regular/indefinite contracts. More specifically, the negative effect, which emanates from this indicator, reflects the following, that increase job insecurity and depress individual expectations: (a) a "relaxation" of the conditions in which workers can be dismissed; (b) a reduction in the notification period and the severance pay, which is associated to the dismissal; (c) a reduction of the compensation for unfair dismissal and the lack of a possible reinstatement following

unfair dismissal. This increase in jobs insecurity would affect negatively the demand for housing by the following channels: (1) commercial banks would tighten credit standards, which curb the demand for housing and residential investment; (2) during the downturn, "cheap and quick" dismissals would take place, which curb the demand for housing and could increase the number of foreclosures and evictions. This negative impact, which has just been discussed, is captured by our model, as indicated by the negative estimated elasticity (-1.06).

On the other hand, our model identifies a positive relationship between the indicator that measures "Strictness of employment protection - temporary contracts", ep^b, and real residential investment. This positive coefficient can be interpreted along the following lines. The "Strictness of employment protection - temporary contracts" indicator could reflect a change in the institutional set up where there are more cases in which fixed-term contracts are applicable; at the same time it is possible for workers to be hired on fixed-term bases for a longer period. These changes could provoke an increase in the level of employment, which subsequently contributes to a rise in income. Rising income would impact positively the demand for housing. At this stage two mechanisms could operate: (i) individuals who are employed on precarious jobs could demand housing for rental, which creates demand for housing for investors; (ii) in a context where there is no strong prudential policy operating, individuals who are hired on precarious jobs could get into debt and demand new units. Both increases in the demand for housing would provoke an increase in real residential investment. In this case this impact has been quantified as a 4.10 elasticity. Unfortunately, the lack of appropriate data prevents us from isolating the mentioned direct and indirect effects on the demand for housing. However, we should mentioned the fact that in the case of the US there are contributions (Jaison R. Abel and Richard Deitz 2010), which have referred to the "infamous" role played by job precariousness in the context of the US sub-prime crisis where it contributed to accelerating the downturn.

Moving onto the error correction model, only two explanatory variables are found significant. On the one hand, we find a negative impact, which emanates from changes in the ratio "full-time employment-to-total employment", i.e. a 1% increase of the mentioned ratio will provoke a 2.35% and 0.56% decline in real residential investment. On the other hand, we have estimated that changes in real disposable income would impact positively investment in dwelling in the short-run. More specifically, a 1% increase in income would induce a 2.92% increase in residential activity. In addition to that, our short-run model also shows a positive elasticity of households' investment in dwelling in the previous period (0.30). This short-run model also includes an error correction term, which suggests that 32% of the disequilibria between the short-run and the long-run are eliminated in each period.

The stability of our results has been checked by means of the CUSUM and the CUSUM of squares tests (Brown, Durbin, and Evans 1975). Both tests suggest the stability of our estimations since the plot of the CUSUM and CUSUM of squares statistics fall within the 5% critical bounds of parameter stability for the model.

6. Summary and Conclusions

The aim of this paper is to explore the role of job precariousness as a potential driver of the housing cycle. As discussed above, our empirical findings have identified a positive effect of income on demand for housing, and subsequently, on investment in dwelling. Our model also has identified an increase in real residential investment, which relates from the employment creation that happens on a fixed-term basis. On the other hand, the demand for housing and real residential investment do not benefit from either a relative increase of part-time jobs or a reduction of employment protection.

Our analysis has provided some justification of the hypothesis that job insecurity impairs the recovery of the housing market, through its negative effects on income and expectations. A better understanding of these links is needed since the recovery of the housing market should be based on a "healthy" labour market that protects its workers, and permits the recovery of economic activity. The results of our investigation challenge the mainstream approach, which inspired the 2012 labour market reform implemented in Spain and suggests that policy makers should be prudent when increasing flexibility in the labour market during the downturn of the housing market. This is so in view of the fact that job destruction could be accelerated by a decline of employment protection during the downturn which eventually affects negatively aggregate demand, and subsequently the demand for housing. We may clarify that any attempt to analyse the impact of the mentioned labour reforms falls beyond the scope of this paper. The focus of this paper is broader, as it has attempted to bring some light to the issue of a possible role of the institutional set up of the labour market in the intensity of the housing cycle.

The empirical evidence produced in this contribution has opened the "door" for several questions, which need to be explored in the future such as the importance of adopting measures that target employment protection and flexibility in different segments of the population; for example, young workers who can be identified with first-home buyers and workers aged above 45 who are considered as prime savers.

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