Job protection and mortgage conditions: Evidence from Italian administrative data

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Abstract

In this paper we combine administrative data from the Italian National Institute for Social Security and proprietary data from a major Italian commercial bank to analyse the impact of job protection legislation on mortgage conditions. An exogenous change in the degree of job protection against individual dismissals of workers with open-ended contracts is identified by exploiting the 2015 Labor market reform, the so-called Jobs Act, which reduced employment protection of newly hired employees in medium and large private firms. We find that the weaker job security induced by the 2015 legislation change leads to a lower mortgage amount and a lower leveraging capacity, as measured by the loan-to-value ratio. Furthermore, the effect of job insecurity is mitigated by the presence of co-mortgagors while it is amplified for young and low-income mortgagors.

Keywords: Employment protection law; job stability; mortgage market

JEL Classification Numbers: C21; G21; G51; J41

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1 Introduction

In the last decades, the labor market of many European countries witnessed major institutional reforms (Boeri, 2011; Turrini et al., 2014; Eichhorst et al., 2017). A common aspect of this wave of reforms has been the transition towards a greater flexibility of labor contracts and lower protection of insiders against individual dismissals, with the aim to increase the labor demand over the cycle and favor the employment of young outsiders. Italy is not an exception in this regard.[1]

While the impact of labor reforms on aggregate unemployment and labor market outcomes has been extensively analyzed in the literature,[2] the possible effects of job flexibility on other aspects of workers' economic life and well being remain relatively unexplored. However, these broader effects of job insecurity taking place outside the labor market are of utmost importance to have a comprehensive assessment of labor market flexibility reforms.

In this paper, we focus on one specific non-labor effect of labor market reforms by exploring if and to what extent the degree of job protection against possible dismissals affects the conditions of access to the mortgage market for workers in terms of loan-to-value ratio (LTV, hereafter), mortgage amount and interest rate scheme (fixed-rate mortgages versus adjustable-rate mortgages).

We build a granular dataset that combines proprietary data on mortgages from a major Italian commercial bank and administrative data on mortgagors' employment position from the Italian National Institute for Social Security (Istituto Nazionale di Previdenza Sociale, "INPS"). We take advantage of an exogenous change in employment protection legislation (EPL, hereafter) for new employees in medium and large private enterprises introduced by the 2015 Jobs Act reform (law no. 183/2014) to test for the causal effect of job (in)security on the mortgage market.

Italy represents a very interesting case study for two main reasons. First, the Italian labour market has been historically characterised by high levels of EPL and firing restrictions (Sestito, 2002; Schivardi and Torrini, 2008). Second, Italian young adults achieve residential independence and become homeowners rather late in life compared to their counterparts in

[1] See Schindler (2009) and Berton et al. (2012) for a review of labor market reforms occurred in the 1990s and early 2000s in a comparative perspective, and Pinelli et al. (2017) for a review of more recent events.

[2] See Boeri and Jimeno (2005) for a theoretical approach and a discussion on the empirical evidence in OECD economies.

the rest of Europe, and make less use of mortgage loans (Chiuri and Jappelli, 2003). In this context, the new dismissal regime introduced by the Italian Jobs Act for newly hired permanent workers after the 7th of March 2015 represents an important discontinuity in EPL that allows to explore how the degree of job security affects workers' access to mortgage loans. Empirically, we use a difference-in-differences approach, comparing initial mortgage conditions for mortgagors who are newly hired workers against other mortgagors in the period before and after the 7th of March 2015. Given that the Jobs Act only applies to workers employed in companies with more than 15 employees, we focus the analysis on mortgages taken out by this group of workers. Our primary and preferred estimation results refer to the restricted sample of single person mortgages for which the mortgage conditions are exactly matched with the employment position of the mortgagor. We show that, conditioning on salary, age and other observable characteristics, initial mortgage conditions do not systematically differ between newly hired and non-newly hired mortgagors in the pre-Jobs-Act periods, while a difference arises for employees that are newly hired after the 7th of March 2015. Specifically, mortgage loans of mortgagors hired under the weaker dismissal rules of the Jobs Act display significantly lower amounts and LTV ratios, while the type of mortgage interest rate (fixed-rate versus adjustable-rate) is unaffected. When extending the sample to mortgages with two contractors, we show that the effect of job insecurity induced by the Jobs Act is mitigated by the presence of a co-mortgagor. We interpret this as evidence of within-contract insurance among co-borrowers that mitigates the effects of the increased income uncertainty due to the lower job protection. Finally, we exploit cross-sectional heterogeneity among mortgagors in our sample and find that the differences in initial mortgage conditions arising after the Jobs Act are larger and more precisely estimated for younger and lower-income employees. This is in line with the hypothesis that lower job protection affects strongly more financially-vulnerable mortgagors. No significant heterogeneous effects arise, instead, between male and female mortgagors.Taken together, our findings suggest that job insecurity affects the leveraging capacity of mortgagors. The reason is potentially twofold. On the one side, job insecurity impacts on loan demand because the mortgagor(s) anticipates the risk embedded in the commitment to long-term contracts with respect to future uncertain job conditions. On the other side, our empirical results are compatible with a se-

lection process by the financial intermediary that, after the reform, favours the mortgage applications by newly hired workers that are endowed with larger down payments. Given that we do not observe loan applications, we cannot provide a formal test to disentangle the effects of the loan demand vis-á-vis those resulting from the selection process of the bank. However, from informal interviews with senior managers of the mortgage division of our data provider, we know that the formal underwriting process of the bank has not changed after the Jobs Act, and that it does not formally incorporate information about the degree of job protection of the mortgagors. For that reason, a more plausible explanation is that the lower LTV and amounts of mortgages taken by mortgagors hired under the new EPL regime is primarily driven by the effect of lower job protection on mortgagors' demand.[3]

This paper contributes to the literature that identifies the impact of EPL on employees' non-labour-market outcomes such as workers' effort (Ichino and Riphahn, 2005; Acharya et al., 2014), fertility (Prifti and Vuri, 2013; De Paola et al., 2021), health (Benach et al., 2014; Minelli et al., 2014; Shahidi et al., 2016), job satisfaction, happiness and well-being (Bardasi and Francesconi, 2004; Origo and Pagani, 2009; Dräger, 2015; Ritzen, 2019). Our findings complement these studies by focusing on the impact of EPL on a different dimension of workers' well-being concerning the funding needs and the initial conditions of access to mortgages. This is a crucial dimension, as mortgages represent the most important households' liability in developed economies (Badev et al., 2014), and mortgage underwriting conditions have a strong impact on households' welfare and their consumption over the life cycle (see Browning and Crossley, 2001, for a review). In addition, housing prices and mortgage conditions are major determinants for the choice of young adults of leaving parental home and forming new households (Martínez-Granado and Ruiz-Castillo, 2002; Giannelli and Monfardini, 2003; Martins and Villanueva, 2006; Bayrakdar and Coulter, 2018). Indeed, the macroeconomic literature provides useful insights on the potential impact of labor in-

[3] A more formal confirmation of the prominence of demand-side response to the Jobs Acts comes from an *ad hoc* estimation based on a large sample of mortgage applications drawn from a widely-used on-line platform, "mutui online", and analyzed in Michelangeli et al. (2020). The analysis shows that, controlling for mortgage characteristics and bank fixed effects, the probability of mortgage rejection did not significantly change between 2014 and 2016 (before and after the Jobs Act) neither for applicants with open-ended labour contracts nor for those with fixed-term labour contracts. The estimates have been kindly elaborated by Valentina Michelageli during her thoughtful discussion of this paper at the Bank of Italy research workshop in 2020 and are available upon request from the authors. This evidence is in line with the opinion reported by the managers of our bank, that no significant shifts in the selection procedures of Italian banks occurred in the years around the Jobs Act, especially in relation to mortgagors' labour contract conditions.

come risk on the households' welfare through the decision to buy a house via mortgage market (Campbell and Cocco, 2003; Bajari et al., 2013). Consistently, the micro literature on homeownership indicates that employment and income insecurity decrease housing demand (De Salvo and Eeckhoudt, 1982; Robst et al., 1999; Diaz Serrano, 2005b,c) and the likelihood of holding a mortgage loan (Dotti Sani and Acciai, 2018; Akdogan et al., 2019). Likewise, there is clear evidence that credit constraints and strict mortgage requirements have a negative impact on homeownership of young adults and accentuate the negative effects of job insecurity (Bourassa, 1995; Haurin et al., 1997; Barakova et al., 2003; Chiuri and Jappelli, 2003; Quercia et al., 2003; Lersch and Dewilde, 2015). However, to the best of our knowledge, the empirical literature has been silent on the effects of job protection on mortgage contract terms absent household-level administrative dataset that matches detailed information on the employment conditions of the mortgagors and initial conditions of their mortgages. Second, we contribute to the empirical banking literature that analyzes the determinants of households' mortgage conditions; related papers have investigated the role of financial regulation (Campbell et al., 2015; Beltratti et al., 2017), market structure (Allen et al., 2014; Benetton, 2021) and economic incentives of the banks in their role of financial advisors (Foà et al., 2019; Guiso et al., 2022). Our focus is on the role of job protection legislation.

The remainder of the paper is organized as follows. Section 2 presents the the institutional setting and defines the identification strategy. Section 3 describes the dataset and shows summary statistics. Section 4 discusses the empirical specification and contains the estimation results. Section 5 provides a discussion of the results, and Section 6 concludes.

2 Institutional setting and identification strategy

The purpose of the empirical analysis is to study the differences in the initial contractual conditions of mortgages taken out by employees with different degrees of job protection. Of course, we cannot rely on an experimental setting with random assignment of job protection intensity in the cross-section of Italian households. However, we can use a quasi-experimental identification strategy that exploits the time and cross-sectional variation in job protection induced by the 2015 Italian Jobs Act reform.

2.1 The Italian Jobs Act

Italy has one of the strictest EPL against collective and individual dismissals of permanent workers among OECD countries, and one of the lowest rates of entry into the labor market with a regular open-ended employment contract. The stated aim of the Italian Jobs Act is to facilitate the permanent hiring of young workers by diminishing the employment protection of insiders and reducing firing costs for the employers.

Under the dismissal regime prior to the Jobs Act, firms could terminate employment contracts only for "just cause", motivated by the need to reorganize or downsize their business activities or by the detection of a serious misconduct of the worker, including abuse of sick leave, theft or improper use of company funds and property for own interests, carrying out personal activities during working hours and having business relations with competitors, suppliers or buyers. In the event that the fired workers sued the firm for unlawful dismissal, and the court recognized the absence of a just cause, the consequences and costs for the employer varied according to its size. Small firms with less than 15 employees could choose either to compensate the workers with a payment varying between 2.5 to 6 times their monthly pay according to their seniority or to reinstate the workers in their job. Firms with 15 or more employees, instead, were due to reinstate the workers in the job: reinstatement was compulsory by law, unless a private agreement was reached for the termination of the labor contract without, however, any predetermined limit for the severance payment to the worker. In this context, the firing costs were highly uncertain both in amount and timing, depending on the length of the trial at the civil court and on the great deal of discretion that the law left to the judge regarding the detection of cases of unfair dismissal. This, according to the opinion of many scholars (Garibaldi, 1998; Messina and Vallanti, 2007) and of the Italian legislator, discouraged Italian firms from creating new jobs, making labor demand relatively unresponsive to the cycle, and hampered job turnover and (re-)entry in the labor market.[4] On the flip side, however, being hired on an open-ended contract in a medium-large firm before the Jobs Act meant for workers to achieve almost total job and income security, regardless of their seniority.

[4]In Italy, the average ratio of long-term non-employed individuals to the unemployed labor force in the period 1995-2018 was around 60%, almost twice the average ratio of OECD countries in the same period; conditional on job separation, Italian workers show a low probability of re-employment within one year and display large and permanent earning losses Jin et al. (2016).

Starting from the mid-1990s, in order to circumvent the rigidity imposed on permanent employment contracts, various forms of atypical fixed-term contracts have been introduced in the Italian employment legislation. This created a strong segmentation in the labor market between permanent and (permanently) fixed-term employees, expanding the area of precarious work but leaving the rigidity on permanent employment contracts unaffected (Boeri and Garibaldi, 2007, 2019; Cahuc, 2012).[5] The 2015 Jobs Act reform has reduced the degree of job protection for permanent workers by limiting the possibility of reinstatement to few specific cases related to discriminatory dismissals and non-existing breach of conduct. In addition, it stated unfair dismissals to be compensated by a predetermined monetary penalty proportional to the tenure of the employee: from a minimum of 4 monthly pay for those who have been employed for less than two years to a maximum of 24 months at a 12-year tenure.[6] Also, the Jobs Act encourages the use of an out-of-court procedure, according to which the employer undertakes to pay the worker an indemnity, not subject to taxation, of 2 months for the first two years of tenure and one month for each of the following years up to a maximum of 18 months, and the worker undertakes not to take legal action for discriminatory or unfair dismissal.[7]

The Jobs Act was introduced into the Italian legislation in December 2014 with the enabling law no. 183 and entered into force in March 2015. The reform applies to open-ended contracts signed after the 7th of March 2015 by firms with more than 15 employees. All other employees (those hired before the 7th of March 2015 by firms exceeding 15 employees, and all the permanent workers in firms with less than 15 employees) have remained covered by the previous law protection regime.

2.2 The Italian mortgage market

Compared to other developed countries, Italy is characterized by a high home-ownership rate; at the same time, Italian households make less use of mortgage loans for home pur-

[5] According to the OECD statistics, the share of temporary workers increased in Italy from 7.2% of total employment in 1995 to 17% in 2019 (before the COVID-19 crisis), with over 60% of new employees hired using atypical fixed-term employment contracts (precisely, the share of temporary contracts for workers aged between 15 and 24 years was 17.9% in 1995 and and 63.3% in 2019).

[6] The sentence of the Constitutional Court of September 25th, 2018, has increased the monetary penalty for unfair dismissal from a minimum of 6-months' pay to a maximum of 36-months' pay.

[7] A more detailed description of the new dismissal regime introduced by the Jobs Act is made by Sestito and Viviano (2018) and Boeri and Garibaldi (2019).

chases. As plot (a) of Figure 1 shows, 71% of Italian dwellings were occupied by owners in 2018, in line with the average of the European Union countries, but well above the home-ownership rate registered in France (60,6%), Germany (43,8%), the United Kingdom (64,9%) and the United States (64,2%) in the same year. By contrast, made 100 the number of houses occupied by owners, only 14% were occupied by household with a mortgage in place, compared to 61% in the United States, 47% in the United Kingdom, 42% in Germany and a European average of 28%. This reflects a lower propensity to borrow of Italian households,[8], but also the delay with which individuals in Italy become homeowners for the first time in life due to the job insecurity of young people and frictions in accessing the mortgage market for fixed-term workers (Chiuri and Jappelli, 2003; Andrews and Sánchez, 2011; Lersch and Dewilde, 2015; Akdogan et al., 2019).

Insert Figure 1 here

After the introduction of the Jobs Act in 2015, the share of homeowners with mortgages rapidly decreased in Italy by 4 percentage points, from 14.2% in 2014 to 10.3% in 2018, contrary to what happened in France, Germany, the United Kingdom and the United States where this share has remained stable (Figure 1, plot 1(b)). In 2019, the stock of outstanding residential loans in Italy is 21% of GDP (in the eurozone and United Kingdom this figures is on average 54%), and only half of the more than five hundred thousand housing transactions negotiated in 2020 are with a mortgage (EMF-ECBC, 2021).

Information on labor positions of mortgagors and initial conditions of mortgages in Italy can be retrieved from the 2012-2016 waves of the Survey of Households Income and Wealth (SHIW), a survey administered every two years by the Bank of Italy to a representative sample of households. In constructing the summary statistics, for the sake of comparability with the sample considered in our empirical analysis, we consider households whose head is employed in the private sector. In this subsample, there are 870 households (1,115 individuals) with mortgages to buy or renovate a house; in line with the figure from OECD data, the average share of homeonwers with a mortgage is 28.7%. As reported in Table 2, the age of the head of the household when the mortgage starts is 38.3, the share of mortgages where

[8] According to the OECD statistics, total debt of Italian households is 87% of their disposable income in 2018, a value significantly lower than that of France (120%), Germany (93%), Spain (107%), the UK (145%) and the United States (103%) (Guiso et al., 2022).

at least one family member has an open-ended contract is 95% and the average net labour income per day of the head of the household is about 90 euros.[9] The average initial mortgage amount is about 103,000 euro and the LTV is 70.4%. Finally, about 47% of mortgages are fixed rate.

Insert Table 1 here

2.3 Empirical strategy

To test the relation between job protection and mortgage conditions we exploit variation in EPL introduced by the Jobs Act in 2015. Specifically, we compare the initial conditions of mortgages taken out by employees that are hired in the year of the mortgage (newly hired mortgagors) with those of the mortgages other employees (not newly hired mortgagors). Given that differences in initial mortgage conditions between these two groups of mortgagors may preexist the 2015 reform, we ultimately combine this cross-sectional difference (newly-hired vs others) with the time variation induced by the starting date of the labour contract (if the employee has been hired before or after 2015). Formally, we estimate the following difference-in-differences model:

$$y_{it} = \beta_0 + \beta_1(\textit{Newly hired})_{it} + \beta_2(\textit{Newly hired after March 7th 2015})_{it} + \beta_3 X_{it} + \phi_j + \phi_s + \tau_t + \varepsilon_{it} \quad (1)$$

where y_{it} measures initial conditions of the mortgage i in the year t concerning three outcome variables: i) the LTV ratio, ii) the amount of the mortgage, iii) the interest rate scheme (an indicator variable that take the value 1 for FRM contracts and 0 for ARM contracts). The indicator variable *Newly hired* identifies if the mortgage i is in the name of a worker that is newly hired in the same year t the mortgage contract is taken out; the variable *Newly hired after March 7th 2015* identifies mortgages of a newly hired employee under the Jobs Act's dismissal regime that are taken out in the same year of hiring.[10] Equation (1) includes a set

[9] Unfortunately, SHIW does not provide information about the number, gender and education of co-mortgagors.

[10] Note that, as it will be discussed in details in the Section 3, for each mortgage i we observe the year t but not the exact date of the contract. For this reason, for the 2015, we cannot exclude that some mortgages of newly hired employees under the Jobs Act regime have been signed between the 1st of January and the 6th of March 2015. In the robustness Section 4.5, we provide evidence that our results are confirmed when excluding the mortgages signed by employees that are newly hired in the months around the starting date of the Jobs Act.

of X_{it} variables that account for observable characteristics of the mortgagors at the time t of signing the mortgage contract. Finally, the specification includes province (NUTS 2) fixed effects ϕ_j and sector fixed effects ϕ_s (defined at the 2-digit Ateco 2007 level)[11] to account for unobserved characteristics at the geographical and sector level that may affect initial mortgage conditions, and year fixed effects τ_t to account for common time shocks.[12] Given the repeated cross-section structure of our sample, due to the fact that we observe exclusively individuals who take out only one mortgage contract during the sample period, we cannot include individual fixed effects in the specification. The β_2 coefficient is interpreted in a diff-in-diff fashion: it indicates whether there is a significant change in the differences in initial mortgage conditions between newly hired worker(s) against the other(s), depending on if the worker(s) has been hired under the Jobs Act regime or before.

Summing up, our identification strategy focuses only on the sub-sample of mortgages where mortgagors are employed in companies above the threshold of 15 employees, for which the new dismissal regime of the Jobs Act applies, by estimating the before-after difference in difference between the initial conditions of mortgages underwritten by newly and non-newly hired employees. Therefore, we do not rely on the time difference between newly-hired employees in companies above and below the 15 employees threshold, which has been used in the studies assessing the labour market effects of the Jobs Act (Sestito and Viviano, 2018; Boeri and Garibaldi, 2019; Pigini and Staffolani, 2022). This is for two reasons. First, for legal reasons, the 15 employee threshold is measured with noise and can be marginally manipulated by the employers (Sestito and Viviano, 2018); hence, a regression discontinuity design (RD) is hardly implementable in this context.[13] However, moving down from the 15 employees threshold and analyzing employees in very small firms may entail significant confounding factors, especially regarding the initial mortgage conditions. Indeed, employees in micro and very small enterprises are often linked directly or indirectly via family ties to the employer, and this may have effects on job stability, access to credit, house demand and mortgage conditions. As ownership and survival of micro enterprises

[11] ATECO is the industry classification adopted by the Italian Institute of Statistics (ISTAT) and substantially coincides with the NACE classification.

[12] Our baseline results are also robust to the inclusion of time linear trends in place of time fixed effects, to the inclusion of province-per-year fixed effects, to the inclusion of companies' total employees as additional regressor or to the inclusion of firm-size dummies defined using the quintiles of the distribution. Results, not shown for brevity, are available upon request.

[13] Indeed, related papers that study the impact of the Jobs Act typically do not rely on a RD strategy.

change rapidly over time and are highly uncertain, these effects are time-varying and hard to be controlled for. A second reason to focus on mortgages underwritten by mortgagors hired in firms above 15 employees is that starting from January 2015 the Italian government introduced a sizeable hiring subsidy for any new job opened on a permanent basis.[14] The hiring subsidy applied to all firms, irrespective of their size, and as documented by Boeri and Garibaldi (2019), smaller firms reacted more intensively by creating more new open-ended contracts. As a consequence, using newly-hired employees in companies below 15 as a control group in our DiD setting may be unwarranted, as their composition may have changed significantly in the years around 2015. By contrast, the effects of the Jobs Act on firings costs (and, hence, on job protection, the focus of our paper) are concentrated on larger firms (Boeri and Garibaldi, 2019). Therefore, we exclude mortgages taken out by employees in smaller firms from our empirical strategy.[15] However, as an additional test, we show the results for the sample where all mortgagors are employed in companies with less than 15 employees.

3 Dataset and summary statistics

Our initial database comprises 84,951 mortgages to buy or renovate a primary or secondary house supplied by a large Italian commercial bank in the period 2013-2017. For each mortgage we observe the following initial mortgage contract conditions: the amount of the loan, the amount of the mortgage loan over the lender-assessed value of the house (LTV) and an indicator for FRM and ARM contracts.[16] In addition, the database includes the date of the mortgage and the number of co-mortgagors holding the mortgage and a unique identifica-

[14] It is important to note that in principle the introduction of a hiring subsidy program has major effects on the firm employment decisions. Not surprisingly, the key issue addressed by Sestito and Viviano (2018) and Boeri and Garibaldi (2019) is precisely whether and to what extent the effects on firm hiring in open-ended contracts after the Jobs Act can be ascribed to the new employment protection regime or to the concurrent policy of subsidies to hiring. In our context, the latter dimension of the policy can reasonably be expected to have second order effects on the bank and mortgagor decisions on mortgage conditions and the value of the house to buy, basically due to possible selection effects on the newly hired (for example, the subsidy might induce firms to spend less resources on the hiring selection process, recruiting less valuable and creditworthy workers).

[15] As robustness test, we also replicate baseline results in a sample that include mortgages where at least one co-mortgagor is employed in a company above 15 employees, while the other is employed in small firms below 15 employees; results, not shown for brevity, are available upon request.

[16] A limitation of our dataset is that mortgage interest rates and mortgage duration are not available.

tion code of each mortgagor. This sample of mortgagors is matched with the INPS archive.[17] This archive provides information on the job conditions of the universe of Italian workers employed in private firms, and retired workers. We keep only mortgage contracts for which we obtain a match with all the co-mortgagors. This reduces the sample of mortgages to 56,694. After merging we also drop mortgages whose holders have extreme values of the salary, top and bottom 1% of the salary distribution.

Table 2 provides summary statistics of the variables that are used in the empirical analysis. The average amount of mortgages in our sample is 98,850 euro and about half of the mortgages have fixed interest rate. The average LTV in our sample is 68.5%. The share of mortgages with a single mortgagor is 65%, while 34% of mortgages in our sample has two co-mortgagors.[18] In about 59% of mortgages in the sample the mortgagor (in single person mortgages) or co-mortgagor in (joint mortgages) is female.

Insert Table 2 here

Turning to job-level information, the average salary per day of the mortgagors, that is the monthly salary divided by working days recorded in INPS, is 94 euro.[19] In 93% of mortgages, all co-mortgagors have open-ended contract and this share rises to 98% if we consider at least one mortgagor with an open-ended job contract. In 6% of mortgages, one of the co-mortgagor has a fixed-term labour contract, and this share drops to zero when we consider single person mortgages. These figures are consistent with the evidence that job security is an almost necessary requirement, for the lender as well as for the borrower, to open a mortgage loan. Indeed, on the supply side, the presence of a mortgagor with an open-ended labor contract is highly valued by the banks because of the implied wage stability and the consequent lower delinquency probability (Diaz Serrano, 2005a). On the demand side, job

[17]To guarantee the anonymity of the mortgagors, the unique identification codes have been transformed at the source by an algorithm unknown to the authors. The matching has been then performed by the INPS using the transformed identifiers. Furthermore, the numerical values of mortgage amounts and LTV have been preliminary rounded to zero decimal (the nearest integer). Finally, the exact date of the conclusion of the mortgage contract has not been made available, except from the year.

[18]In the initial sample of mortgages, before the merge with the INPS archive, the share of mortgages with a single mortgagor is 51%, while 45% of mortgages has two co-mortgagors; the rest have three or four co-mortgagors. The potential over-representation of mortgages with a single mortgagor in our sample is due to the matching strategy described above and by the limit of the INPS archive which does not contain information for public employees. As a result, some mortgages with more than one accountholder are not matched with the INPS archive.

[19]We replicate the empirical analyses by considering salary per week instead of salary per day. The results of these tests are available upon request.

security has a significant impact on the perspective of the households in making long-term investment and durable consumption choices, such as buying a house and getting into long-term debt with the bank. On average, the age of mortgagors is 38 years. Only in 1% of mortgages one of the mortgagor is retired, receiving a pension by the INPS, and these mortgages are excluded from the empirical analysis. In 75% (61%) of mortgages, at least one mortgagor (all co-mortgagors) is employed in a firm with more than 15 employees. The average size of firms where mortgagors work is about 2,700 employees with a sizeable standard deviation (about 13,000).[20] In 13% of mortgages, at least one of the mortgagors is newly hired, that is she/he have been hired in the same year when the mortgage contract is opened, and in 9% of mortgages at least one mortgagor is hired after the 7th of March 2015. In 6% of mortgages, all mortgagors are newly hired, and in 4% of them all mortgagors are hired after the 7th of March 2015. [21] It is important to note that, summary statistics from our sample, although consisting of mortgages issued by a single bank, are very close to the summary statistics from SHIW reported in Table 1 and this reassures us about the representativeness of the sample and the external validity of our case study.

4 Econometric results

In this section we provide estimates of equation (1) using the sample of mortgages in which mortgagors are employed in firms above 15 employees. In Section 4.1, we report our preferred results concerning single person mortgage contract. In Section 4.2, we extend the analysis to two-person mortgages.[22] In Section 4.3, we consider year-by-year regressions to run a check for the parallel trend assumption and to establish the dynamic effect of the Jobs Act. In Section 4.4 we test for possible differentiated effects of job protection on mortgage conditions according to mortgagors' level of salary when entering the mortgage contract, age, and gender. Finally, in Section 4.5 we provide robustness checks of the baseline results.

[20]The number of employees of each Italian firm is recorded by INPS at monthly frequency. The variable "firm labor force" is a full time equivalent measure that we average at yearly level. The median number of employees in firms where mortgagors work is 278 (unreported in Table 2).

[21]The share of newly hired mortgagors is increasing in the period 2013-2017. This figure is in line with the Italian macroeconomic trend in recruitment rates after 2015.

[22]The residual share of mortgages regard contracts with strictly more than two co-mortgagors (1% of the overall sample), which are excluded from the current analysis.

4.1 Single-person mortgages

Our main analysis focuses on the sample of mortgages with a single mortgagor. The reason is twofold: a) for this sample of mortgages we do not have to distinguish between different hiring dates for the co-mortgagors and, hence, the assignment of the mortgages to the Jobs Act regime is unambiguous; b) given that there is one worker per mortgage, and the unit of observation in the analysis is the mortgage contract, we do not need to average the labour contract conditions (e.g., salary) and the demographic characteristics of the mortgagors (e.g., age). The summary statistics reported in Table 3 refers to the group of single person mortgages analyzed in the current analysis and includes only workers at firms above the 15 employee threshold. It shows that, in the period 2013-2017, mortgage-level variables are broadly similar between the groups of newly hired and not newly hired mortgagors, although, as expected, the second group displays on average lower salaries per day and lower age. The two groups are instead well balanced in terms of share of female mortgagors and the firms' size as measured by total number of employees. As mentioned in the previous section, in our sample there is no single person mortgage whose mortgagor has a fixed-term labour contract. Out of 1,784 individuals identified as newly hired, 70% of them are hired under the Jobs Act regime.

Insert Table 3 here

Regression estimates are reported in Table 4. We find that, conditioning on salary, age, gender, and province, sector and time fixed effects, mortgages taken by newly hired employees do not display significant differences with respect to the others before the Jobs Act. By contrast, a statistically significant difference emerges for mortgages taken by newly hired employees under the Jobs Act regime in terms of loan amount and LTV ratio, while the likelihood of having an FRM contract is no different than that prevailing among mortgages to non-newly hired employees. In terms of magnitude, newly hired employees under the Jobs Act regime open mortgages that are, on average, about 5,000 euros lower than others, which is about 5% of average mortgage amount. In addition, they display a lower LTV by about 2.3 percentage points. These findings are consistent with the hypothesis that lower job protection is passed-through the initial mortgage conditions, which require smaller monthly payments and/or larger mortgage down-payments.

Insert Table 4 here

The coefficients attached to the job-level regressors have the expected signs. Larger labour income is significantly associated to lower LTV and larger mortgage amount. Age is negatively associated to mortgage amount and LTV and are positively associated with the probability of fixed interest rate. This is in line with the hypothesis that younger mortgagors are more risk averse and less able to get into debt with banks. Finally, female mortgagors display significantly larger mortgage amount while we do not detect a statistical significant difference in terms of the LTV ratio.

4.2 Including two-person mortgages

In this section, we extend the sample above by including mortgages with two co-mortgagors. We distinguish three groups of mortgages: a) mortgages where a single mortgagor or both co-mortgagors are newly hired (*All newly hired*); b) mortgages where one of the co-mortgagors is newly hired and the other is not (*One newly hired*); c) mortgages where the single mortgagor or both co-mortgagors are not newly hired (*All not newly hired*). Summary statistics for the three groups are reported in Table 5. This enlarged sample includes 34,496 mortgages, where 5.5% of these refer to *All newly hired* mortgages, and 10.1% refer to mortgages with at least *One newly hired*. It is interesting to note that the group of mortgages with only one newly hired mortgagor displays, on average, larger amounts and lower down-payments than the *All not newly hired* group. This suggests that the presence of a co-mortgagor with a "secure job" acts as a guarantor and the newly-hired mortgagors than can leverage more on their loans.

Insert Table 5 here

First, in the empirical analysis we compare initial conditions of *All newly hired* mortgages with respect to those of the other two groups. Results in Table 6 are in line with the findings in Section 4.1: the LTV and mortgage amount are significantly lower when all co-mortgagors are newly hired under the Jobs Act regime. In this extended analysis, we include, as additional regressors, the number of mortgagors and an indicator variable that accounts for the presence of a co-mortgagor with an open-ended contract. Having two co-mortgagors

is associated with significantly larger LTV and mortgage amount and lower probability of fixed-rate mortgages; furthermore, the presence of a co-mortgagor with open-ended contract is associated with a significantly lower mortgage amount (about 14,000 euros smaller, on average) and a larger LTV.

Insert Table 6 here

As a second empirical exercise (Table 7), we separately identify the impact of the Jobs Act on *All newly hired* and *One newly hired* mortgages. In this specification: i) the coefficient attached to the variable *At least one newly hired after March 7th 2015* indicates the difference in initial mortgage conditions between *One newly hired* and *All not newly hired* mortgages after the Jobs Act; ii) the coefficient on *All newly hired after March 7th 2015* indicates the difference between *All newly hired* and *One newly hired* mortgages; iii) the sum of the two coefficients attached to the variables *At least one newly hired after March 7th 2015* and *All newly hired after March 7th 2015* indicates the difference between *all newly hired* and other mortgages, that is the estimated coefficients in Table 6. Results in Table 7, show that the initial conditions of *one newly hired* mortgages are not statistically different from those of *All not newly hired* ones. This result suggests that the presence of one co-mortgagor hired under stronger job protection law abates the negative effect of the Jobs Act on LTV ratio and mortgage amounts. Mortgages where both mortgagors are newly hired under the Jobs Act display significantly lower LTVs compared with both *One newly hired* and *All not newly hired* mortgages. In terms of mortgage amount, the difference between *All newly hired* and *One newly hired* is negative and close to 3,500 (eur) although noisily estimated.[23]

Insert Table 7 here

Finally, as an additional test, we replicate the analysis in Table 7 for the sub-sample of mortgages where all mortgagors are employed in a company below the 15 employees threshold and hence do not experience any change in job protection in 2015. Results in Table 8 show that initial mortgage conditions of newly hired employees after March 7th 2015 are

[23] As third strategy, we enlarge the sample and include mortgages where one of the co-mortgagor is employed in a company below the 15 employees threshold. After this inclusion, the total number of mortgages increase by about 7,000 observations. We replicate the analysis in Table 7 using this enlarged sample and the empirical results, available upon request, are confirmed.

not statistically different with respect to those of newly hired employees before the Jobs Act. Furthermore, newly hired workers after the Jobs Act display larger mortgage amount, an evidence that contrasts with our baseline findings on the impact of job insecurity on mortgage demand. Note that, in light of the discussion in Section 2.3, the identification of the impact of the Jobs Act for workers in companies below 15 employees may suffer from potential confounding factors, and must then interpreted with caution.

Insert Table 8 here

4.3 Dynamic effects of the Jobs Act

In this section, we perform year-by-year regression analyses to check for the parallel trend assumption and confirm the reliability of our strategy. Results are displayed graphically in Figures 2 and 3 for, respectively, the sample of single-person mortgages and the extended sample including two-person mortgages. All regressions include the full set of regressors used in the baseline analysis as well as sector and province fixed effects. In Figure 3, we report coefficient estimates relative to a specification where we test for the difference between *All newly hired* mortgages and all the other mortgages. Each plot in the two figures refers to the three outcome variables, LTV, Mortgage amount and Fixed rate. The bullets in each plot are the estimated coefficients of the year-by-year regressions, while red lines display the upper and lower bounds of confidence intervals at 10% significance level. Both figures confirm the absence of pre-2015 differences in initial mortgage conditions between newly hired and not newly hired mortgagors: the point estimates are close to zero both in 2013 and 2014, and the confidence intervals of the estimates in these two years practically overlaps, confirming the absence of a pre-reform trend in the outcome variables. When analyzing the estimates using the group of newly hired employees under the Jobs Act, a significant difference in initial mortgage conditions emerges, especially regarding LTV and mortgage amount. We also observe a positive jump in the difference of the fraction of mortgages with fixed rate in 2015 and 2016, but this difference reverts in 2017, making the average estimates in the above regression analyses not statistically different from zero. In line with the baseline results, the impact is more precisely estimated for the sub-group of single person mortgages.

Insert Figures 2 and 3 here

4.4 Heterogeneity analysis

So far, we have shown that the weakening of the job protection conditions caused by the Jobs Act have a significant impact on the initial conditions of mortgages taken out by newly hired employees, which are on average of lower amounts and provide for larger down-payments (i.e, smaller LTV ratio). To the extent that the economic mechanism behind these findings is linked to the transfer of risk from a lower employment protection to a lower ability of regular repayment mortgage installments, we should expect our results to be mostly driven by the subgroup of mortgagors that are more vulnerable in financial terms and more risk averse. We exploit two potential dimensions of individual financial fragility as measured by the wage income and age. Indeed, low-income and young households are expected to have a lower stock of liquid savings and are relatively more exposed to default risk when their employment is less protected by the legislation. Second, we verify if the baseline effect of job protection is stronger for female mortgagor(s), given that the literature acknowledges that females tend to display larger risk aversion than males in financial decisions (Sunden and Surette, 1998; Croson and Gneezy, 2009).

We re-estimate specifications in Table 4, for single-person mortgages, and Table 7, for the extended sample with two-person mortgages, by distinguishing the subgroups of mortgagors that have a salary per day and an age below the sample median values (respectively, 82.3 euros and 37 years), and for the subgroup of (at least one) female (co-)mortgagors. Results are presented in Panels A, B and C of Tables 9 and 10. As expected, we find larger and more precisely estimated impacts on LTV and mortgage amounts for low-paid and young mortgagors who are newly hired under the Jobs Act. By contrast, we find mixed evidence for a differential impact of job protection on initial mortgage conditions of female (co-)mortgagors. Precisely, we find that female single mortgagors under Jobs Act regime display significantly lower mortgage amount, although no significant impact is detected on LTV (Table 9, Panel C). When extending the sample to multiple person mortgages with at least one female co-mortgagor, we find that the coefficients of interest are of lower magnitude than the baseline estimates and are also more noisily estimated (Table 10, Panel C).

Insert Tables 9 and 10 here

4.5 Robustness tests

In this section, we discuss the robustness of our baseline results to a number of checks concerning the sample composition and control variables.

4.5.1 Mortgage date

As mentioned in the Section 3, we do not observe the exact date of the mortgage but the year. For this reason, we cannot exclude that a fraction of the mortgages taken in 2015 by newly hired employees have been signed between January and the 7th of March 2015, that is before the application of the Jobs Act. Hence, although the Jobs Act was passed in December 2014 and it is reasonable to assume that firms have postponed hiring until after the 7th of March to take advantage of the less strict dismissal regime of the new legislation, our results may be biased by a potential measurement error. For that reason, we replicate our analysis by excluding mortgages taken out by newly hired employees in the five months preceding and following the starting date of the Jobs Act, that is all newly hired employees between October 2014 and July 2015. We replicate the baseline results in Tables 4 after excluding this group of newly hired employees. Results reported in Panel A of Table 11 confirm the robustness of our estimates to this check.[24]

4.5.2 Mortgagors' education

Among observable variables in the baseline specification, we did not include the education of the mortgagors. Although this variable potentially represents an important control, it is available in the INPS database only for a limited number of employees. Specifically, we retrieve from the INPS archive a qualitative record of education, that is available for about 40% of observations in our baseline sample. As a robustness check, we replicate the baseline results in Tables 4 after including in the specification education dummies that identify workers with elementary, middle school and high school or college degree. Results reported in Panel B of Table 11 confirm the robustness of our estimates to the inclusion of this observable characteristic of the mortgagors.

[24]For the current and the other robustness checks outlined in this section, we provide in the paper the estimates for the sample that includes single person mortgages; consistently with the baseline analysis, we have also verified the robustness checks by using the larger sample that includes multiple mortgage contracts. These results, not showed for brevity, are available upon request.

4.5.3 Home renovation and youth mortgages

In selecting the mortgages in our sample, we run robustness checks by excluding two specific types of mortgages: i) mortgages that are used exclusively to renovate an house and not for buying motives; ii) mortgages for young adults that are guaranteed also by the national government by a specific fund whose aim is to foster home-ownership among the youngest households in Italy.[25] Those mortgages represent, respectively, the 1.4% and the 3.6% of mortgages in our sample. We replicate the baseline results in Panels C and D of Table 11. Again, our baseline estimates are confirmed after these exclusions.

Insert Table 11 here

5 Did the Jobs Act affect the extensive margin?

As stated above, one of the objectives of the Jobs Act is to reduce the expected firing costs of permanent workers incurred by the firms. This, while increasing job insecurity, also potentially increase the use of permanent open-ended labour contracts by hiring firms. To the extent that having a permanent job position is almost a "conditio sine qua non" for taking a mortgage, the Jobs Act may have entailed the access to the mortgage market for a larger share of private employees. Unfortunately, we cannot rely on a dataset that covers the universe of mortgages together with detailed information on mortgagors' labour conditions.[26] Therefore, we are not able to provide a definitive assessment of the effects that the employment stabilization, induced by the Jobs Act, has had on mortgage allocations at the aggregate level. However we can still provide an insightful analysis of the effects of Jobs Act on the extensive margin, by using information on the universe of mortgages, the age of the mortgagors and their region of residence. This data is drawn from the Central Credit Register operated by the Bank of Italy, that covers almost the universe of mortgage contracts by Italian banks.

[25] This national fund is named "Fondo Garanzia Giovani" and involves households with at least one member less than 35-years old. The number of mortgages guaranteed by this fund are 28 in 2015, 559 in 2016 and 674 in 2017.

[26] To the best of our knowledge, such a dataset has never been collected in Italy, nor it is available for other countries, and actually this is the first study matching mortgage-level data with administrative data on mortgagors, even if for mortgages from a single bank.

In what follows, we reasonably assume that the cohorts of younger workers are the most affected by the job stabilization effects induced by the Jobs Act, and that these groups of workers are looking for their first mortgage. Thus, in Figure 4 we report the series of total first mortgages allocated in Italy by the universe of banks in the period 2013-2017. The upper panel displays the series of total mortgages by splitting the mortgagors according to their age-group. The graphical analysis shows that there is a significant growing trend in the number of mortgages granted in Italy in the period under scrutiny. However, no significant break occurs from 2015 across age-cohorts.[27] The bottom-panel of Figure 4 displays the series of total first mortgages by splitting Italian regions into two groups: *High growing regions* are the ten regions with the highest growth rate of newly-hired workers with open-ended contracts between 2014 and 2015; *Low growing regions* are the ten regions with the lowest growth rate of newly-hired workers with open-ended contracts between 2014 and 2015. This split provides a test of the effectiveness of the employment stabilization induced by the Jobs Act by exploiting geographical variation, rather than cohort-level variation. Also in this case, we do not detect significant breaks after 2014. Finally, in upper and bottom panels of Figure 5, we reproduce the series of total first mortgages by mortgagors' age-group in the two sets of regions (*High growing regions* and *Low growing regions*). The graphical inspection reveals no evidence of a differential trend in total first mortgages between the younger and older cohorts of employees.[28]

Summing up, this preliminary evidence based on aggregate figures suggests that the employment stabilization effect induced by the Jobs Act had no significant effect on the aggregate mortgage market. Importantly for our identification strategy, this evidence is in line with the hypothesis that the composition of the pool of mortgagors, and possibly of applicants to the mortgage market, did not change from 2015 in terms of both age and geographical distribution.

Insert Figures 4 and 5 here

[27] This non-significance result is confirmed by a more rigorous difference-in-differences regression analysis that formally evaluate the hypothesis of a statistical break in the series of mortgages for different cohorts. Precisely, the difference before and after 2015 in the difference between first mortgages taken out by the mortgagors aged up to 35 (the treated group) and mortgagors aged more than 36 (the control group) does not result statistically significant at any standard confidence level. The results of these tests are available upon request.

[28] Also in this case, difference-in-differences estimations confirm the non-significance result.

6 Conclusions

In this paper, we build a novel dataset that combines Italian administrative sources and proprietary mortgage-level information, and show that the job insecurity associated with the degree of EPL has a significant impact on initial mortgage conditions. We exploit the variation induced by the 2015 Italian labour market reform (Jobs Act) and show that newly hired employees under the new weaker job protection regime display significantly lower levels of LTV and mortgage amounts compared to similar newly hired employees under the previous job protection regime. We additionally show that the impact of job protection is lower for joint mortgages, stronger for low-income and younger mortgagors. A limitation of our analysis is that, given the unavailability of information on mortgage applications in our dataset, we cannot univocally identify whether the effect is driven by more conservative demand of mortgages by borrowers or by a restriction in mortgage supply conditions. This important issue is left to future research.

References

Acharya, V. V., R. P. Baghai, and K. V. Subramanian (2014). Wrongful discharge laws and innovation. *The Review of Financial Studies 27*(1), 301–346.

Akdogan, K., E. Karacimen, and A. A. Yavuz (2019). Cross-country evidence on the link between job security and housing credit. *Journal of Housing and the Built Environment 34*(4), 947–963.

Allen, J., R. Clark, and J.-F. Houde (2014). The effect of mergers in search markets: evidence from the Canadian mortgage industry. *American Economic Review 104*(10), 3365–96.

Andrews, D. and A. C. Sánchez (2011). Drivers of homeownership rates in selected OECD countries. OECD Economics Department Working Papers 849, OECD.

Badev, A., T. Beck, L. Vado, and S. Walley (2014). Housing finance across countries: new data and analysis. Technical Report WPS6756, Policy Research Working Paper.

Bajari, P., P. Chan, D. Krueger, and D. Miller (2013). A dynamic model of housing demand: Estimation and policy implications. *International Economic Review 54*(2), 409–442.

Barakova, I., R. Bostic, P. Calem, and S. Wachter (2003). Does credit quality matter for homeownership? *Journal of Housing Economics 12*(4), 318–336.

Bardasi, E. and M. Francesconi (2004). The impact of atypical employment on individual wellbeing: evidence from a panel of British workers. *Social Science & Medicine 58*(9), 1671–1688.

Bayrakdar, S. and R. Coulter (2018). Parents, local house prices, and leaving home in Britain. *Population Space and Place 24*, e2087.

Beltratti, A., M. Benetton, and A. Gavazza (2017). The role of prepayment penalties in mortgage loans. *Journal of Banking & Finance 82*, 165–179.

Benach, J., A. Vives, M. Amable, C. Vanroelen, G. Tarafa, and C. Muntaner (2014). Precarious employment: understanding an emerging social determinant of health. *Annual Review of Public Health 35*(1), 229–253.

Benetton, M. (2021). Leverage regulation and market structure: A structural model of the uk mortgage market. *The Journal of Finance 76*(6), 2997–3053.

Berton, F., M. Richiardi, and S. Sacchi (2012). *The political economy of work security and flexibility. Italy in a comparative perspective*. Bristol, UK: Policy Press.

Boeri, T. (2011). Institutional reforms and dualism in European labor markets. In D. Card and O. Ashenfelter (Eds.), *Handbook of Labor Economics*, Volume 4b, Chapter 13, pp. 1173–1236. Amsterdam: Elsevier.

Boeri, T. and P. Garibaldi (2007). Two-tier reforms of employment protection: a honeymoon effect? *Economic Journal 117*(521), 357–385.

Boeri, T. and P. Garibaldi (2019). A tale of comprehensive labor market reforms: evidence from the Italian Jobs Act. *Labour Economics 59*, 33–48.

Boeri, T. and J. F. Jimeno (2005). The effects of employment protection: learning from variable enforcement. *European Economic Review 49*(8), 2057–2077.

Bourassa, S. (1995). The impacts of affordable lending efforts on homeownership rates. *Urban Studies 32*(7), 1163–1173.

Browning, M. and T. F. Crossley (2001). The life-cycle model of consumption and saving. *Journal of Economic Perspectives 15*(3), 3–22.

Cahuc, P. (2012). For a unified contract. *European Journal of Law 3*(3), 190–205.

Campbell, J. Y. and J. F. Cocco (2003). Household risk management and optimal mortgage choice. *The Quarterly Journal of Economics 118*(4), 1449–1494.

Campbell, J. Y., T. Ramadorai, and B. Ranish (2015). The impact of regulation on mortgage risk: evidence from India. *American Economic Journal: Economic Policy 7*(4), 71–102.

Chiuri, M. C. and T. Jappelli (2003). Financial market imperfections and home ownership: A comparative study. *European Economic Review 47*(5), 857–875.

Croson, R. and U. Gneezy (2009, June). Gender differences in preferences. *Journal of Economic Literature 47*(2), 448–74.

De Paola, M., R. Nisticó, and V. Scoppa (2021). Fertility decisions and employment protection: The unintended consequences of the Italian Jobs Act. *Economic Policy 36*(108), 735–773.

De Salvo, J. and L. Eeckhoudt (1982). Household behavior under income uncertainty in a monocentric urban area. *Journal of Urban Economics 11*(1), 98–111.

Diaz Serrano, L. (2005a). Income volatility and residential mortgage delinquency across the EU. *Journal of Housing Economics 14*(3), 153–177.

Diaz Serrano, L. (2005b). Labor income uncertainty, skewness and homeownership: a panel data study for Germany and Spain. *Journal of Urban Economics 58*(1), 156–176.

Diaz Serrano, L. (2005c). On the negative relationship between labor income uncertainty and homeownership: Risk-aversion vs. credit constraints. *Journal of Housing Economics 14*(2), 109–126.

Dotti Sani, G. M. and C. Acciai (2018). Two hearts and a loan? Mortgages, employment insecurity and earnings among young couples in six European countries. *Urban Studies 55*(11), 2451–2469.

Dräger, V. (2015). Do employment protection reforms affect well-being? Discussion Paper 914, IZA.

Eichhorst, W., P. Marx, and C. Wehner (2017). Labor market reforms in Europe: Towards more flexicure labor markets? *Journal for Labour Market Research 51*(1), Article 3.

EMF-ECBC (2021). Hypostat 2021. A review of Europe's mortgage and housing markets. Technical report, European Mortgage Federation - European Covered Bond Council, Bruxelles.

Foà, G., L. Gambacorta, L. Guiso, and P. E. Mistrulli (2019). The supply side of household finance. *The Review of Financial Studies 32*(10), 3762–3798.

Garibaldi, P. (1998). Job flow dynamics and firing restrictions. *European Economic Review 42*(2), 245–275.

Giannelli, G. and C. Monfardini (2003). Joint decisions on household membership and human capital accumulation of youths. The role of expected earnings and local markets. *Journal of Population Economics 16*(2), 265–285.

Guiso, L., A. Pozzi, A. Tsoy, L. Gambacorta, and P. E. Mistrulli (2022). The cost of steering in financial markets: Evidence from the mortgage market. *Journal of Financial Economics 143*, 1209–1226.

Haurin, D., P. Hendershott, and S. Wachter (1997). Borrowing constraints and the tenure choice of young households. *Journal of Housing Research 8*(2), 137–154.

Ichino, A. and R. T. Riphahn (2005). The effect of employment protection on worker effort: absenteeism during and after probation. *Journal of the European Economic Association 3*(1), 120–143.

Jin, Y., R. Fukahori, and H. Morgavi (2016). Labour market transitions in Italy: Job separation, re-employment and policy implications. OECD Economics Department Working Papers 1291, OECD.

Lersch, P. M. and C. Dewilde (2015). Employment insecurity and first-time homeownership: Evidence from twenty-two European countries. *Environment and Planning A 47*(3), 607–624.

Martins, N. C. and E. Villanueva (2006). The impact of credit constraints on household formation. In *Labour Market Adjustments in Europe*, Volume 7. Edward Elgar Publishing.

Martínez-Granado, M. and J. Ruiz-Castillo (2002). The decisions of spanish youth: a cross-section study. *Journal of Population Economics 15*(2), 305–330.

Messina, J. and G. Vallanti (2007). Job flow dynamics and firing restrictions: Evidence from Europe. *Economic Journal 117*(521), 279–301.

Michelangeli, V., J.-L. Peydró, and E. Sette (2020). Credit demand versus supply: Randomized experimental- and administrative-based evidence. CEPR Discussion Papers 15726, Centre for Economic Policy Research.

Minelli, L., C. Pigini, M. Chiavarini, and F. Bartolucci (2014). Employment status and perceived health condition: longitudinal data from Italy. *BMC Public Healthh 14*(1), 946–957.

Origo, F. and L. Pagani (2009). Flexicurity and job satisfaction in Europe: the importance of perceived and actual stability for well-being at work. *Labour Economics 16*(5), 547–555.

Pigini, C. and S. Staffolani (2022). Firing costs and job loss: The case of the Italian jobs act. *Italian Economic Journal 8*(1), 105–143.

Pinelli, D., R. Torre, L. Pace, L. Cassio, A. Arpaia, et al. (2017). The recent reform of the labour market in Italy: A review. European Economy - Discussion Paper 72, European Commission.

Prifti, E. and D. Vuri (2013). Employment protection and fertility: evidence from the 1990 Italian reform. *Labour Economics 23*, 77–88.

Quercia, R., G. McCarthy, and M. Wachter (2003). The impacts of affordable lending efforts on homeownership rates. *Journal of Housing Economics 12*(1), 29–59.

Ritzen, J. (2019). Happiness as a guide to labor market policy. Technical Report 149, IZA World of Labor.

Robst, J., R. Deitz, and K. McGoldrick (1999). Income variability, uncertainty and housing tenure choice. *Regional Science & Urban Economics 29*(2), 219–229.

Schindler, M. M. (2009). The Italian labor market: recent trends, institutions, and reform options. Technical report, IMF Working Papers.

Schivardi, F. and R. Torrini (2008). Identifying the effects of firing restrictions through size-contingent differences in regulation. *Labour Economics 15*(3), 482–511.

Sestito, P. (2002). *Il mercato del lavoro in Italia: com'è, come sta cambiando*. Bari: Laterza.

Sestito, P. and E. Viviano (2018). Hiring incentives and/or firing cost reduction? Evaluating the impact of the 2015 policies on the Italian labour market. *Economic Policy 33*(93), 101–130.

Shahidi, F. V., D. De Moortel, C. Muntaner, O. Davis, and A. Siddiqi (2016). Do flexicurity policies protect workers from the adverse health consequences of temporary employment? a cross-national comparative analysis. *SSM-Population Health 2*, 674–682.

Sunden, A. E. and B. J. Surette (1998). Gender differences in the allocation of assets in retirement savings plans. *The American Economic Review 88*(2), 207–211.

Turrini, A., G. Koltay, F. Pierini, C. Goffard, and A. Kiss (2014). A decade of labour market reforms in the EU: Insights from the LABREF database. European Economy - Economic Papers 522, European Commission.

A Tables

Table 1: Mortagors' labor position and mortgages' initial conditions in Italy - SHIW (2012-2016)

	Mean	Standard Deviation	Max	Min
Age (head of household) when mortgage contract starts	38.30	8.20	61.00	18.00
At least one family member with open-ended contract	0.95	0.22	1.00	0.00
Average net labor income per day (head of household - eur)	90.82	51.61	833.33	12.50
Initial mortgage amount (eur thousands)	103.67	57.54	550.00	3.00
Initial mortgage LTV	70.37	25.61	100.00	4.00
Fixed interest rate mortgages	0.47	0.50	1.00	0.00

Average net labor income is calculated as the net annual labor income divided first divided by the months of activity (as reported in SHIW) and then divided by 20 (approximate average number of working days per month). LTV is available for only about 50% of the households in SHIW. For households that report more than one mortgage (about 3% in the sample), we average the variables across the various mortgages.

Table 2: Summary statistics (2013-2017)

	Mean	Standard Deviation	Max	Min
Mortgage-level data				
Mortgage amount (eur thousands)	98.85	44.00	400.00	5.00
Mortgage LTV	68.51	23.67	100.00	9.00
Fixed interest rate	0.48	0.50	1.00	0.00
N. Accountholders	1.35	0.49	4.00	1.00
Single mortgagor	0.65	0.48	1.00	0.00
Female co-mortgagor	0.59	0.49	1.00	0.00
Job-level data				
Average salary per day (eur)	94.08	45.91	335.31	20.11
All mortgagors with open-ended contract	0.93	0.25	1.00	0.00
At least one mortgagor with open-ended contract	0.98	0.15	1.00	0.00
At least one mortgagor with fixed-term contract	0.06	0.21	1.00	0.00
At least one mortgagor retired	0.01	0.09	1.00	0.00
Average age of co-mortgagors	38.19	8.44	70.50	18.00
Min age of co-mortgagors	37.40	8.63	69.00	18.00
Max age of co-mortgagors	38.99	8.73	75.00	18.00
Average N. employees in co-mortgagors' firm	2676.61	12914.72	139175.33	0.00
All mortgagors work in a company above 15 employees	0.61	0.49	1.00	0.00
At least one mortgagor work in a company above 15 employees	0.75	0.44	1.00	0.00
All mortgagors employed in the year of the mortgage (newly hired)	0.06	0.24	1.00	0.00
At least one mortgagor employed in the year of the mortgage (newly hired)	0.13	0.33	1.00	0.00
All mortgagors newly hired after March 7th 2015	0.04	0.20	1.00	0.00
At least one mortgagor newly hired after March 7th 2015	0.09	0.29	1.00	0.00

Table 3: Summary statistics (2013-2017) - Single person mortgages

	Newly hired		Not newly hired	
	Mean	Standard Deviation	Mean	Standard Deviation
Mortgage-level data				
Mortgage amount (eur thousands)	88.25	43.12	91.02	40.93
Mortgage LTV	66.30	23.11	65.24	23.97
Fixed interest rate	0.52	0.50	0.50	0.50
Female mortgagor	0.37	0.48	0.36	0.48
Job-level data				
Salary per day (eur)	99.60	53.89	110.03	52.65
Age	36.39	8.83	39.33	8.40
N. employees in mortgagors' firm	3424.05	9269.75	4021.92	17247.70
Mortgagor with fixed-term contract	0	(.)	0	(.)
Newly hired after March 7th 2015	0.70	0.46	0.00	0.00

Table 4: Jobs Act and initial mortgage conditions: Single person mortgages

	(1)	(2)	(3)
	LTV	Mortgage amount	Fixed rate
Newly hired after March 7th 2015	-2.258**	-4.982**	-0.008
	(1.125)	(2.124)	(0.021)
Newly hired	0.072	2.766	0.026
	(0.909)	(1.787)	(0.016)
Log(Salary per day)	-8.005***	25.475***	0.005
	(0.394)	(0.794)	(0.007)
Age	-0.441***	-0.650***	0.002***
	(0.017)	(0.029)	(0.000)
Female co-mortgagor	-0.410	5.365***	-0.006
	(0.322)	(0.564)	(0.006)
Observations	24739	25509	25509
Adjusted R^2	0.177	0.120	0.305

All specifications include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Summary statistics (2013-2017) - Single and multiple person mortgages

	All newly hired		One newly hired		All not newly hired	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Mortgage-level data						
Mortgage amount (eur thousands)	89.64	43.56	109.28	44.74	98.15	44.38
Mortgage LTV	67.10	23.17	75.36	23.36	66.79	24.02
Fixed interest rate	0.52	0.50	0.48	0.50	0.50	0.50
N. Accountholders	1.07	0.25	2	(.)	1.23	0.42
Single mortgagor	0.93	0.25	0	(.)	0.77	0.42
Female co-mortgagor	0.41	0.49	0.95	0.25	0.51	0.50
Job-level data						
Average salary per day (eur)	98.29	52.97	82.94	45.21	105.93	49.76
Average age of co-mortgagors	36.35	8.76	36.49	8.14	39.12	8.19
Min age of co-mortgagors	36.19	8.78	34.41	8.26	38.64	8.30
Max age of co-mortgagors	36.50	8.83	38.61	8.62	39.61	8.33
Average N. employees in mortgagors' firm	3508.99	9265.40	3954.41	9067.60	4016.05	16576.06
At least one mortgagor with open-ended contract	0.78	0.42	0.97	0.33	0.99	0.10
At least one mortgagor with fixed-term contract	0.02	0.14	0.41	0.41	0.01	0.12
At least one newly hired after March 7th 2015	0.70	0.46	0.76	0.45	0.00	0.00

Table 6: Jobs Act and initial mortgage conditions: Single and multiple person mortgages

	(1)	(2)	(3)
	LTV	Mortgage amount	Fixed rate
All newly hired after March 7th 2015	-1.947*	-4.721**	-0.004
	(1.072)	(2.051)	(0.020)
All newly hired	-0.349	1.662	0.024
	(0.867)	(1.719)	(0.016)
Log(Average salary per day)	-8.725***	25.383***	0.015**
	(0.347)	(0.719)	(0.006)
Average age of co-mortgagors	-0.507***	-0.779***	0.002***
	(0.015)	(0.026)	(0.000)
N. Accountholders	3.991***	33.024***	-0.034***
	(0.285)	(0.580)	(0.006)
At least one mortgagor with fixed-term contract	1.586***	-13.223***	-0.009
	(0.614)	(1.223)	(0.014)
Female co-mortgagor	-0.541**	3.492***	-0.000
	(0.265)	(0.493)	(0.005)
Observations	33594	34496	34496
Adjusted R^2	0.204	0.189	0.296

All regressions include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Jobs Act and initial mortgage conditions II: Single and multiple person mortgages

	(1) LTV	(2) Mortgage amount	(3) Fixed rate
All newly hired after March 7th 2015	-2.969**	-3.440	0.001
	(1.454)	(3.063)	(0.028)
At least one newly hired after March 7th 2015	1.080	-1.367	-0.006
	(1.050)	(2.377)	(0.021)
All newly hired	0.020	3.764	0.012
	(1.230)	(2.717)	(0.023)
At least one newly hired	-0.403	-2.131	0.012
	(0.928)	(2.187)	(0.018)
Log(Average salary per day)	-8.721***	25.345***	0.015**
	(0.347)	(0.719)	(0.006)
Average age of co-mortgagors	-0.507***	-0.781***	0.002***
	(0.015)	(0.026)	(0.000)
N. Accountholders	3.947***	33.368***	-0.035***
	(0.293)	(0.599)	(0.006)
At least one mortgagor with fixed-term contract	1.385**	-11.756***	-0.012
	(0.684)	(1.356)	(0.015)
Female co-mortgagor	-0.539**	3.477***	-0.000
	(0.265)	(0.493)	(0.005)
Observations	33594	34496	34496
Adjusted R^2	0.204	0.189	0.296

All specifications include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Jobs Act and initial mortgage conditions: Single and multiple person mortgages (in companies below 15 employees)

	(1) LTV	(2) Mortgage amount	(3) Fixed rate
All newly hired after March 7th 2015	-2.548	3.088	-0.059
	(2.038)	(4.174)	(0.041)
At least one newly hired after March 7th 2015	-0.995	-1.280	0.012
	(1.639)	(3.505)	(0.033)
All newly hired	1.230	5.875	0.046
	(1.718)	(3.686)	(0.032)
At least one newly hired	0.452	-4.612	-0.015
	(1.402)	(3.153)	(0.027)
Log(Average salary per day)	-1.862***	20.448***	-0.002
	(0.537)	(1.073)	(0.010)
Average age of co-mortgagors	-0.567***	-0.479***	0.003***
	(0.022)	(0.040)	(0.000)
N. Accountholders	6.408***	29.393***	-0.049***
	(0.466)	(0.932)	(0.010)
At least one mortgagor with fixed-term contract	1.377	-10.692***	0.023
	(1.287)	(2.295)	(0.028)
Female co-mortgagor	-0.135	4.479***	-0.012
	(0.413)	(0.764)	(0.008)
Observations	13573	14222	14222
Adjusted R^2	0.187	0.158	0.284

All specifications include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Heterogeneity analysis: Single person mortgages

	(1) LTV	(2) Mortgage amount	(3) Fixed rate
	Panel A: Below median salary		
Newly hired after March 7th 2015	-3.432***	-6.627***	0.011
	(1.307)	(2.337)	(0.026)
Newly hired	-0.216	3.316	0.024
	(1.064)	(2.018)	(0.020)
Observations	15361	15833	15833
Adjusted R^2	0.135	0.074	0.294
Other control variables	Y	Y	Y
	Panel B: Below median age		
Newly hired after March 7th 2015	-2.542**	-8.137***	0.004
	(1.254)	(2.405)	(0.024)
Newly hired	-0.103	4.978**	0.027
	(1.002)	(2.051)	(0.019)
Observations	17189	17770	17770
Adjusted R^2	0.163	0.119	0.303
Other control variables	Y	Y	Y
	Panel C: Female mortgagors		
Newly hired after March 7th 2015	-1.078	-6.663*	0.042
	(1.840)	(3.778)	(0.035)
Newly hired	-2.480*	2.552	0.024
	(1.488)	(3.296)	(0.028)
Observations	8892	9173	9173
Adjusted R^2	0.169	0.124	0.317
Other control variables	Y	Y	Y

All specifications include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Heterogeneity analysis: Single and multiple person mortgages

	(1) LTV	(2) Mortgage amount	(3) Fixed rate	
	Panel A: Below median salary			
All newly hired after March 7th 2015	-4.003**	-4.391	0.021	
	(1.616)	(3.237)	(0.032)	
At least one newly hired after March 7th 2015	1.150	-1.744	-0.007	
	(1.122)	(2.462)	(0.023)	
All newly hired	-0.686	3.213	0.004	
	(1.366)	(2.877)	(0.027)	
At least one newly hired	-0.050	-1.335	0.017	
	(0.996)	(2.261)	(0.020)	
Observations	22352	22923	22923	
Adjusted R^2	0.160	0.204	0.283	
Other control variables	Y	Y	Y	
	Panel B: Below median age			
All newly hired after March 7th 2015	-3.096*	-6.504*	0.020	
	(1.582)	(3.347)	(0.032)	
At least one newly hired after March 7th 2015	0.751	-1.492	-0.014	
	(1.123)	(2.574)	(0.023)	
All newly hired	-0.178	7.224**	-0.004	
	(1.340)	(2.985)	(0.026)	
At least one newly hired	-0.217	-3.297	0.028	
	(1.002)	(2.377)	(0.019)	
Observations	24062	24748	24748	
Adjusted R^2	0.193	0.202	0.290	
Other control variables	Y	Y	Y	Y
	Panel C: Female (co-)mortgagors			
All newly hired after March 7th 2015	-1.571	-6.514	0.048	
	(2.247)	(4.650)	(0.044)	
At least one newly hired after March 7th 2015	0.964	0.555	-0.007	
	(1.558)	(3.375)	(0.032)	
All newly hired	-2.853	3.216	-0.002	
	(1.877)	(4.106)	(0.036)	
At least one newly hired	0.227	-2.232	0.023	
	(1.350)	(3.032)	(0.026)	
Observations	13094	13447	13447	
Adjusted R^2	0.202	0.191	0.301	
Other control variables	Y	Y	Y	

All specifications include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

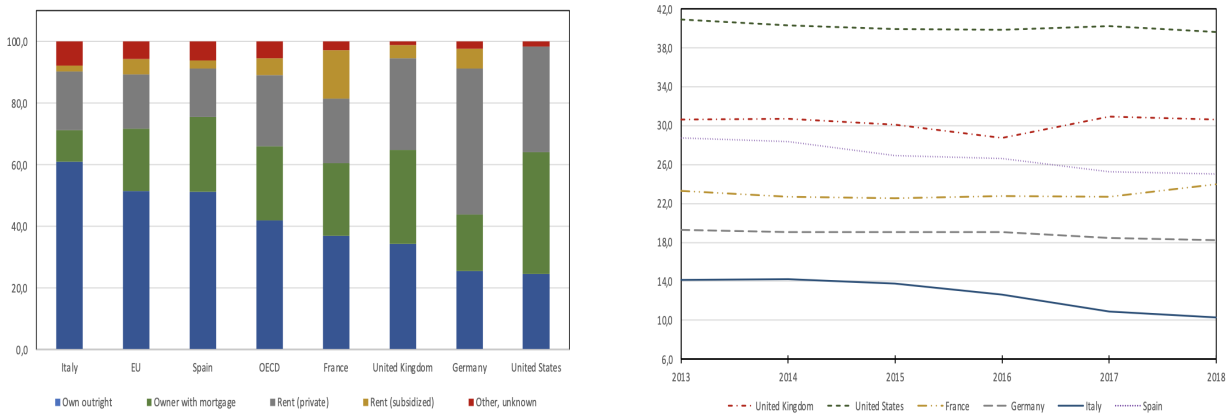
Table 11: Robustness checks: Single person mortgages

	(1) LTV	(2) Mortgage amount	(3) Fixed rate
	Panel A: Hired around March 2015		
Newly hired after March 7th 2015	-2.728**	-7.013***	-0.015
	(1.300)	(2.453)	(0.023)
Newly hired	0.450	4.150*	0.027
	(1.094)	(2.149)	(0.019)
Observations	20853	21441	21441
Adjusted R^2	0.186	0.124	0.309
Other control variables	Y	Y	Y
	Panel B: Education		
Newly hired after March 7th 2015	-3.545***	-6.376**	-0.007
	(1.331)	(2.527)	(0.025)
Newly hired	-0.157	2.382	0.047**
	(1.075)	(2.134)	(0.019)
Observations	11016	11331	11331
Adjusted R^2	0.197	0.140	0.273
Other control variables	Y	Y	Y
	Panel C: House renovation		
Newly hired after March 7th 2015	-2.224**	-4.985**	-0.002
	(1.126)	(2.147)	(0.021)
Newly hired	-0.039	2.728	0.024
	(0.909)	(1.808)	(0.016)
Observations	24333	25103	25103
Adjusted R^2	0.176	0.122	0.299
Other control variables	Y	Y	Y
	Panel D: Public guarantees		
Newly hired after March 7th 2015	-2.351**	-4.804**	-0.009
	(1.130)	(2.146)	(0.021)
Newly hired	0.206	2.664	0.026
	(0.906)	(1.789)	(0.016)
Observations	24043	24812	24812
Adjusted R^2	0.161	0.119	0.310
Other control variables	Y	Y	Y

All specifications include sector, province and year fixed effects.
Standard errors, clustered at mortgage level, are displayed in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

B Figures

Figure 1: Housing occupancy status

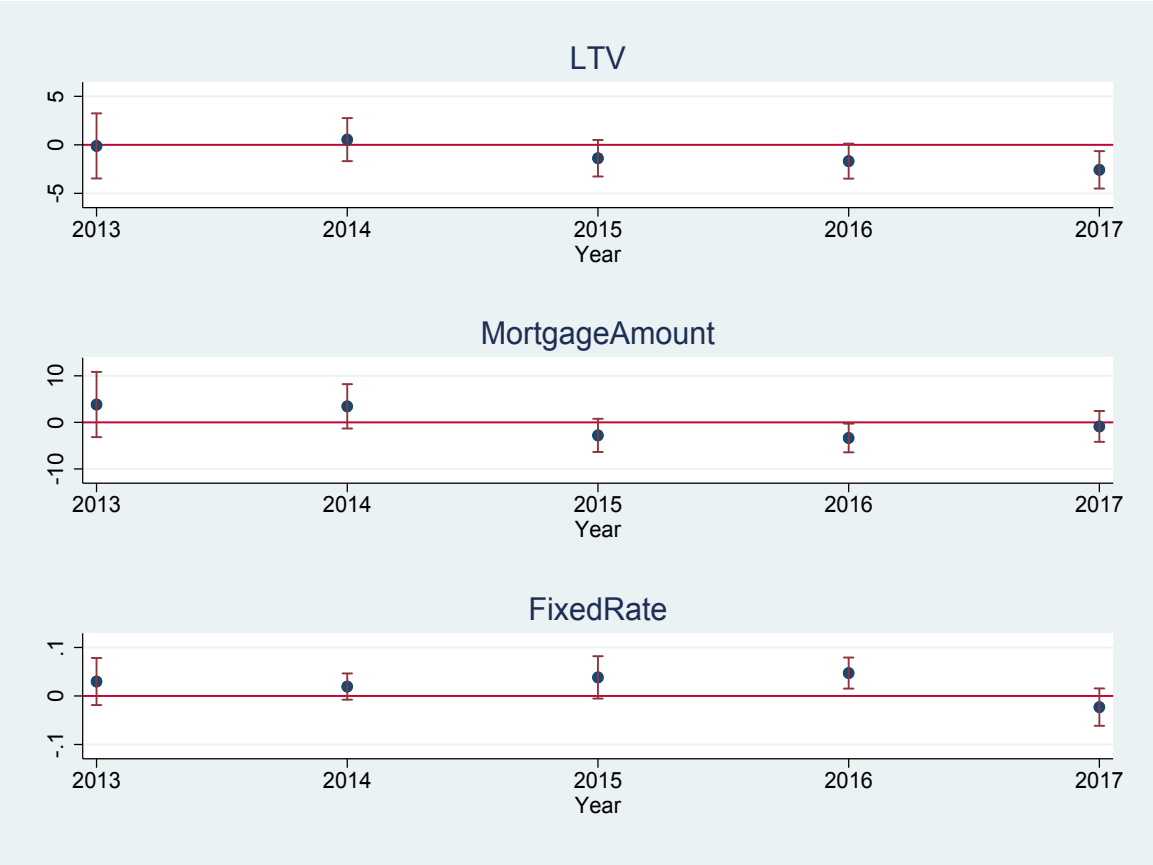


(a) Housing occupancy status distribution

(b) Homeowners with mortgages

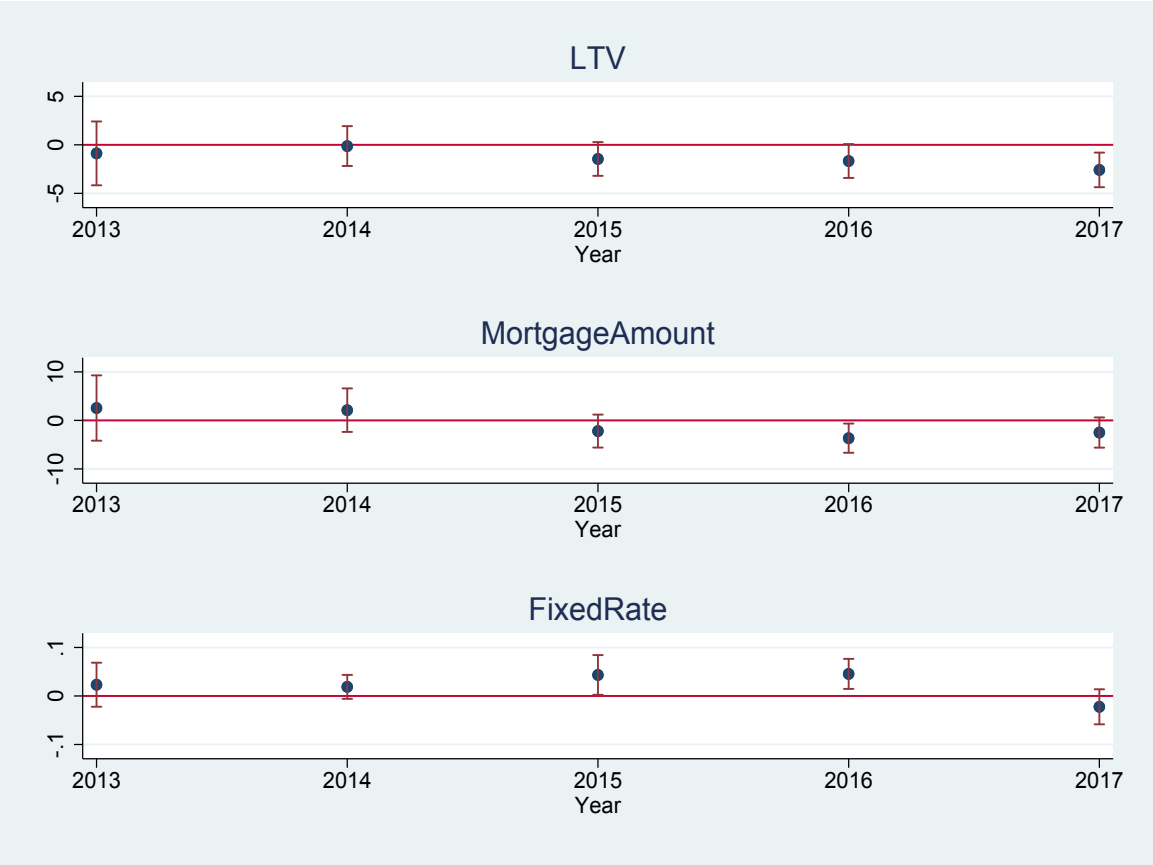
Plot (a) shows the percentage of households in different tenure types in latest year available (2019 or 2018). Plot (b) shows the share of owner with mortgages in the period 2010-2018. Data source: OECD, Housing Market database, available at https://www.oecd.org/housing/data/affordable-housing-database/housing-market.html.

Figure 2: Yearly regressions: Single person mortgages



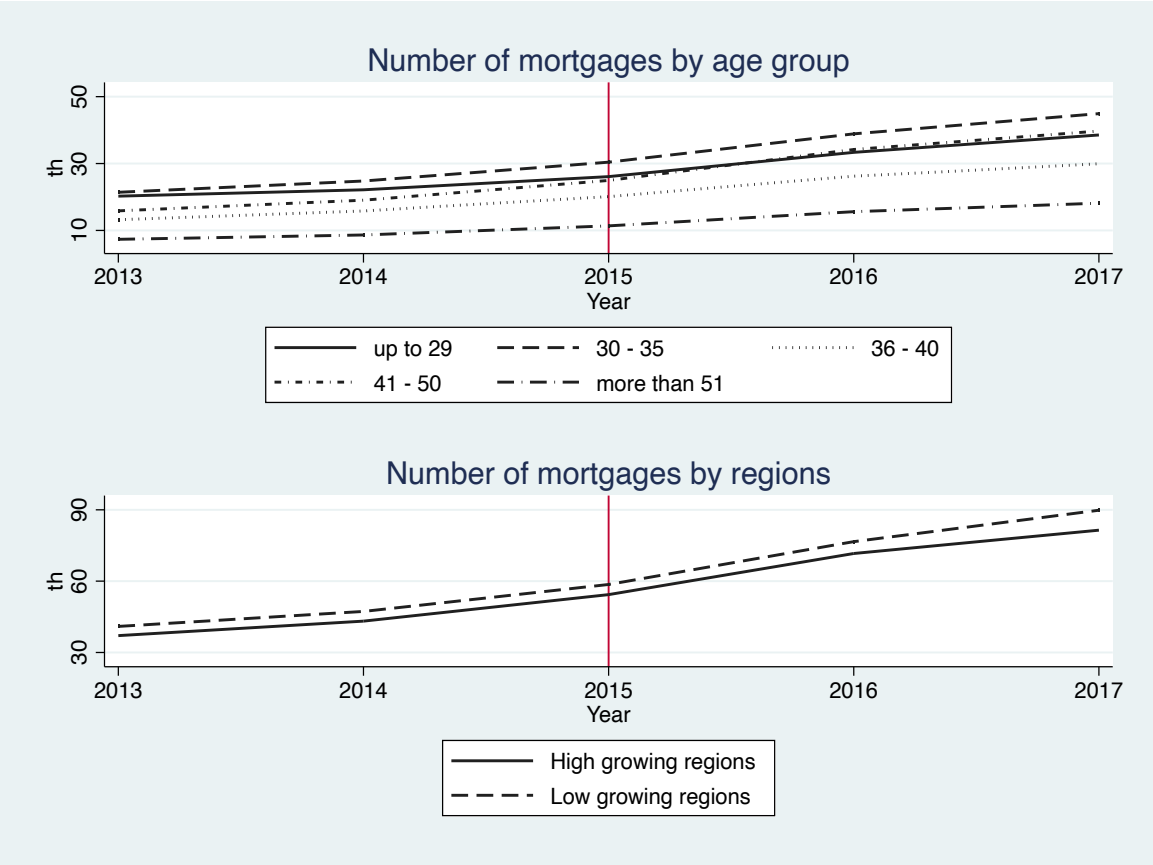
Note. This figure plots coefficient estimates from year-by-year regressions and their relative upper and lower bounds of confidence intervals at 10% level. All regressions include the set of regressors as in the baseline specifications and sector and province fixed effects.

Figure 3: Yearly regressions: Single and multiple person mortgages



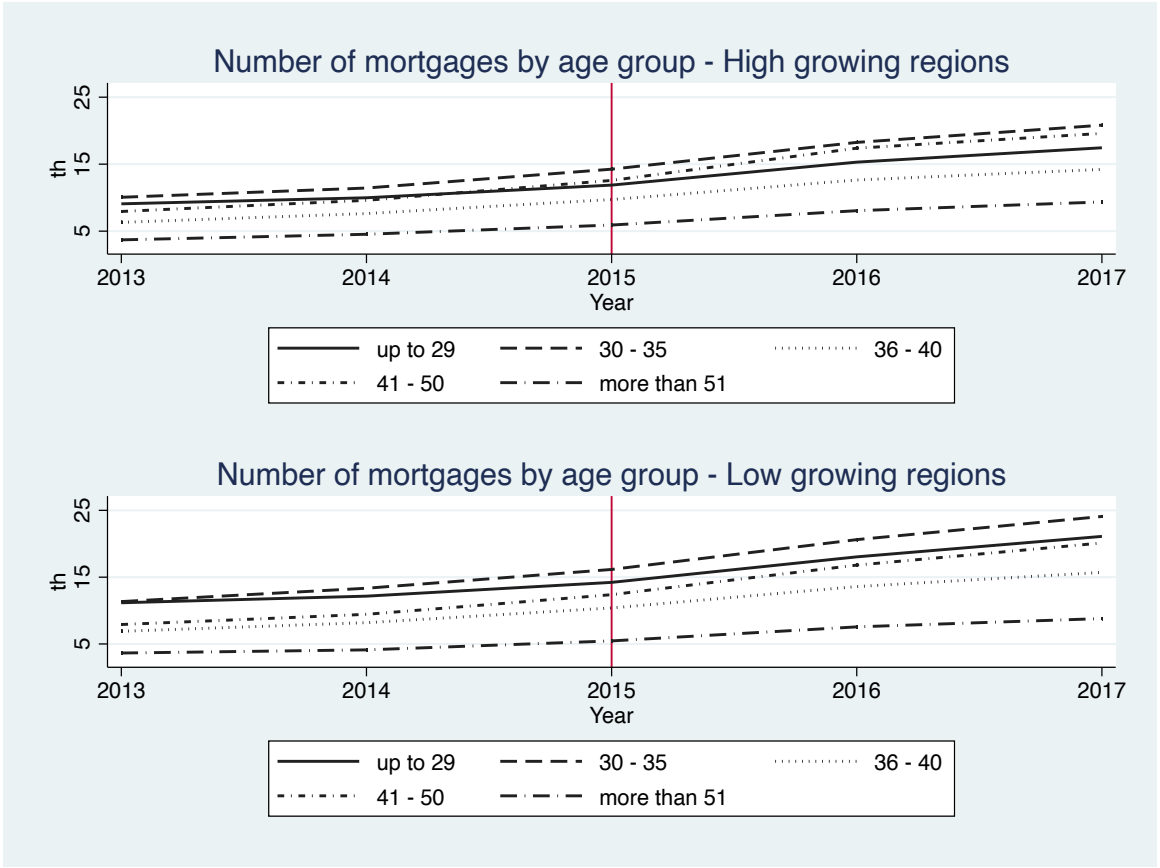
Note. This figure plots coefficient estimates from year-by-year regressions and their relative upper and lower bounds of confidence intervals at 10% level. All regressions include the set of regressors as in the baseline specifications and sector and province fixed effects.

Figure 4: Number of first mortgages by the universe of Italian banks (2013-2017)



Note. This figure plots the series of total mortgages allocated in Italy by the universe of banks in the period 2013-2017 (source: Bank of Italy, Credit Registry). Upper-panel displays the series by splitting the group of mortgagors according to their age. Bottom-panel displays the series by splitting the Italian regions into two groups: *High growing regions* are the Italian regions with the highest growth rate of newly-hired workers with open ended contracts in the years 2014-2015; *Low growing regions* are the Italian regions with the lowest growth rate of newly-hired workers with open ended contracts in the years 2014-2015.

Figure 5: Number of fist mortgages by the universe of Italian banks (2013-2017) - split by age-group and regions



Note. This figure plots the series of total mortgages allocated in Italy by the universe of banks in the period 2013-2017 (source: Bank of Italy, Credit Registry). Upper-panel displays the series by splitting the group of mortgagors according to their age-group and if they belong to the group of regions defined above as *High growing*. Bottom-panel displays the series by splitting the group of mortgagors according to their age-group and if they belong to the group of regions defined above as *Low growing*.