HAL
open science

Job Protection, Housing Market Regulation and the Youth

Antoine Bonleu, Bruno Decreuse, Tanguy van Ypersele

To cite this version:

Antoine Bonleu, Bruno Decreuse, Tanguy van Ypersele. Job Protection, Housing Market Regulation and the Youth. 2016. halshs-01376582

HAL Id: halshs-01376582

https://shs.hal.science/halshs-01376582v1

Preprint submitted on 5 Oct 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

amse
école d'économie d'aix-marseille
aix-marseille school of economics

Working Papers / Documents de travail

Job Protection, Housing Market Regulation and the Youth

Antoine Bonleu
Bruno Decreuse
Tanguy van Ypersele

WP 2016 - Nr 36

Aix*Marseille université
cnrs
L'ECOLE DES HAUTES ETUDES EN SCIENCES SOCIALES
Inserm
IRD Institut de recherche pour le développement
Centrale Marseille

Job protection, housing market regulation and the youth*

Antoine Bonleu, Bruno Decreuse, Tanguy van Ypersele†
Aix-Marseille University (Aix-Marseille School of Economics), EHESS & CNRS

October 2016

Abstract: Young Europeans experience high unemployment rates, job instability and late emancipation. Meanwhile they do not support reforms weakening protection on long-term contracts. In this paper, we suggest a possible rationale for such reform distaste. When the rental market is very regulated, landlords screen applicants with regard to their ability to pay the rent. Protecting regular jobs offers a second-best technology to sort workers, thereby increasing the rental market size. We provide a model where non-employed workers demand protected jobs despite unemployment and the share of short-term jobs increase, whereas rents, wages and the individual risk of dismissal are unaffected.

Keywords: Labor market dualism; Rent default; Screening

JEL classification: R2; K31

*This paper benefited from the comments of participants to the SaM conference in Amsterdam. We thank Bruno van der Linden for his careful reading and suggestions. We also thank the Conseil Régional Provence Alpes Côte d'Azur and the Chaire Transitions Démographiques, transitions Economiques for financial support.

†GREQAM, 2 rue de la charité, 13002 Marseille, France. E-mail: antoine.bonleu@univ-amu.fr

1 Introduction

Young Europeans struggle to find jobs, are over-represented in temporary employment and leave the parental home remarkably late. It is consensual to blame labor and housing market institutions as being responsible for these outcomes. The housing market regulation (HMR) has been accused of reducing the rental market size, thereby contributing to hamper worker mobility. Employment protection legislation (EPL) is viewed as detrimental to labor market entrants by depleting the supply of vacancies and closing access to long-term jobs. However, the actual role played by each set of institutions is still under debate. Moreover, the support for labor market reforms is very tenuous. At best, the youth do not seem interested in such reforms; at worst they demonstrate against them as in 2006 and 2016 in France.

Distrust vis-à-vis pro-market reforms may be rooted in the cultural or legal traits of Continental European countries.[1] In this paper, we argue that the youth distaste for reforms of job protection can also be rational in a context where the rental market is heavily regulated. The key idea is as follows: HMR generates a social demand for job protection as a second-best technology to signal workers' ability to pay the rent. When the rental market is very regulated, landlords need to screen applicants on the basis of the expected risk of rent default. In this goal, landlords use labor market signals to figure out the individual risk of dismissal. When permanent jobs are not protected, selection in long-term employment is low and the mean risk of dismissal is large. Thus landlords are relunctant to rent their dwellings. Protecting jobs forces firms to be more selective so that the quality of the signal vehicled by labor market contracts increases.

We proceed in two steps. Section 2 presents a set of facts motivating our analysis. We use aggregate and micro data from the European Community Household Panel. The country-specific time-varying sets of regulation are due to Kahn (2007) for EPL and Djankov et al (2003) for HMR. In the cross-section of OECD countries, HMR is negatively correlated with youth employment and emancipation, the share of young employees in short-term contracts is positively correlated with EPL; lastly HMR and EPL are positively correlated.

At micro level, we explain individual employment, access to long-term contracts, emancipation and access to rentals with individual fixed effects, country-specific time-varying characteristics and the indices of EPL and HMR. HMR is negatively associated with emancipation and access to rentals but seems uncorrelated with employment, whereas reforms of permanent contracts are strongly negatively correlated with employment and access to long-term jobs, whereas the correlation is weaker with emancipation and access to rentals.

Section 3 offers a model of the housing and labor markets for young workers predicting these correlations at aggregate level and consistent with the effects at micro level. In this model, job protection reduces the odds of employment, increases the share of employees in short-term contracts and does not affect the individual risk of dismissal. Still, nonemployed (young) workers can be in favor of job protection and the social demand for job protection increases with HMR.

[1] Botero et al (2004) put forward the role of the legal origins of the judicial system, French origins being more prone to regulating markets. Algan and Cahuc (2006) highlight machismo and the dominant religion. Algan and Cahuc (2009) examine the role of civic attitudes. Alesina et al (2015) focus on family values.

Firms offer short-term and long-term contracts, whereas landlords select applicants. Firms and landlords are confronted to a similar problem: assessing the ability of applicants to perform the job tasks or pay the rent. However, employers play first. By offering a long-term job instead of a short-term one, firms provide a signal to landlords. The value of this signal increases with the protection of long-term contracts. In countries where the rental market is not very regulated, landlords do not need to screen applicants who can easily be evicted in case of rent default. It follows that the social demand for job protection is low. The opposite situation prevails in countries where the rental market is heavily regulated. There the social demand for EPL is large.

Using job protection as a screening technology is a second-best response to landlords' informational problem. This technology makes sense because the risk of rent default is positively correlated with the risk of dismissal. There is evidence showing that households are more likely to default on the rent or on the mortage reimbursement when unemployed (see, e.g., Eichholtz, 1995, Deng et al, 1996, Serrano-Diaz, 2005, Nivière, 2006, Gerardi et al, 2015). Meanwhile regular jobs last much longer on average than short-term jobs. In the case of youth, labor contracts are the only exploitable signals for landlords. For instance, there is no clean history of rent payments and landlord cannot contact previous landlords to know the applicants better.

This paper calls for reforms of the housing market to reduce the social demand for EPL. This is only after such reforms have been made that job protection can be reduced. Decreuse and van Ypersele (2011) make a complementary point. In their model, job protection reduces the individual risk of dismissal and individuals contract loans with lenders to buy housing units. The equilibrium price of loans decreases with job protection. Therefore nonemployed persons are inclined to set the legislation above the threshold maximizing employment. Our paper shares the view that job security is highly valued when the housing market is regulated. However, the economic mechanism differs: job protection does not reduce the chance of losing one's job; instead it reveals the individual risk. The labor market block of our model borrows from Pries and Rogerson (2005) and Cahuc et al (2016) where each match is associated to a specific risk of dissolution. Selection into labor contracts generates composition effects responsible for the decreasing relationship between job protection and job loss probability. In an extension of our model, we account for these two complementary views of job destruction and job protection. They strengthen each other and contribute to increasing the demand for job protection.

The paper is complementary to the literature on the links between the housing and labor markets. This literature makes the general claim that factors limiting worker mobility have side effects on employment. For instance the Oswald hypothesis posits that unemployment increases with housing ownership because owners are less mobile than renters and cannot easily respond to income or employment shocks by moving to an alternative location. Closer to us Rupert and Wasmer (2012) argue that labor market institutions such as EPL or unemployment compensation have strong effects on unemployment in countries where the rental market is very regulated. In our basic model, HMR does not directly affect employment but decreases it through its impact on the demand for job protection. In an extension, we focus on an extreme situation where occupying a job always involves moving to a new dwelling. Despite firms take into account the effect of the labor contract on the rental probability, selection into employment is too low. Protecting LT jobs make firms more selective, which may improve employment and emancipation.

The paper relates to the literature on the positive analysis of job protection. In their analysis of the regulation of labor, Botero et al (2004) distinguish market failure correction and rent-seeking arguments. Our paper belongs to the former strand of arguments. Most models of job protection feature a potentially nonmonotonic relationship between employment and the strictness of job protection. Having zero protection is an option, but cases where the employment-maximizer level of protection is strictly positive cannot be excluded. This optimal level of protection then depends on the nature of labor market distortions (see Blanchard and Tirole, 2008, for a complete discussion involving EPL and unemployment insurance). In our approach, job protection is used to correct a lemon issue in the housing market. Fixing this problem destroys jobs, but the level of job protection maximizes some sort of social welfare function.

According to the rent-seeking argument, job protection benefits the majority of insiders who already hold regular jobs and is detrimental to outsiders (see, e.g., Saint-Paul, 2001). This literature makes important points but does not help us to understand the wide support for job protection that goes well above the set of installed workers. Our model abstracts from such insiders because already established workers who have found a dwelling do not derive additional benefits from job protection. In an extension, we show two groups of workers prefer strongly protected jobs: individuals with a large probability of success and those with a low probability of success. The former want to belong to a small elite club with large access to the housing market, whereas the latter want to be accompanied in short-term contracts by as many workers as possible to avoid stigmatization.

The consideration of alternative risks and market situations may also contribute to explaining the social demand for job protection as a screening technology. These risks must be correlated with the probability of being successful in an ongoing relationship, and the market situations must involve a screening phase taking place after the labor contract has been attributed. In a final extension to the basic model, we discuss such risks and markets, like the risk of damage to the dwelling due to the tenant's behavior, the risk of mortgage default for lenders, or the risk of marriage dissolution. In each case the strength of regulation motivates screening and the induced demand for protected jobs.

2 Motivating facts

This section presents two sets of facts. We first describe a nexus of aggregate correlations in the cross-section of OECD countries between an index of housing market regulation (HMR), an index of Employment Protection Legislation (EPL), youth employment, youth emancipation, and youth share of employees in short-term jobs. We then turn to micro evidence with the European Community Household Panel (ECHP) and measure the effects of HMR and EPL on the individual probability of employment, access to long-term jobs, emancipation and access to rentals.

2.1 Aggregate evidence

At aggregate level, youth employment and emancipation are negatively correlated with HMR, the share of employed youth in temporary employment is positively correlated with EPL on regular contracts and

HMR and EPL are positively correlated.

Figure 1 confronts the youth employment rate to a measure of HMR. The computation of the youth employment rate is the ratio of employees to total population among the 16-35 in ECHP over the period 1994-2001. The measure of HMR is the index of procedural formalism built by Djankov et al (2003). In the 2003 paper, the index was only available for a year. Balas et al (2009) extend the coverage and the index is available on a yearly basis between 1950 and 2000 for fourty developed and developing countries. They focus on the eviction of a tenant who does not pay the rent. The index is built from several sub-indices that describe the exact procedure used by litigants and courts: the required degree of professionalism of lawyers and judges, the preeminence of written versus oral presentation at each stage of the procedure, the need for legal justification in the complaint and in the judgment, the rules of evidence, the appeal procedure, engagement formalities that must be observed before a party is legally bound by the court proceedings, and the number of independent procedural actions.

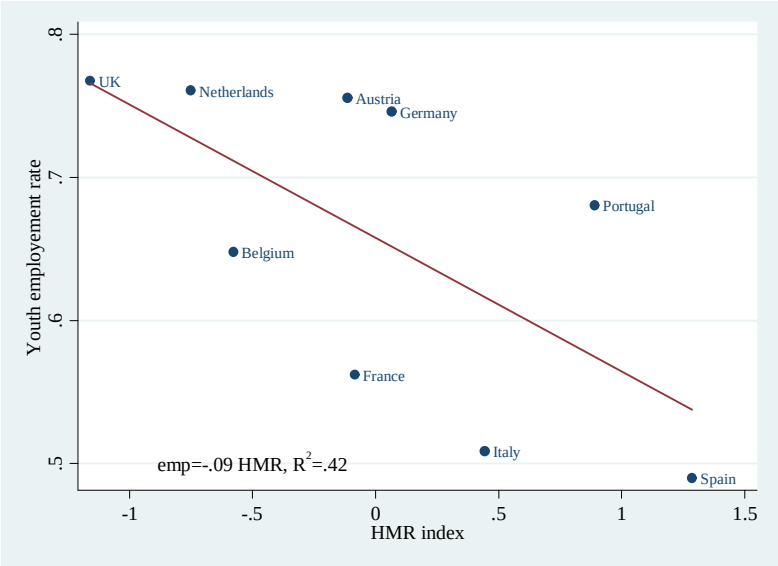


Figure 1: Youth employment and HMR in Europe. Youth employment is the ratio of employees to total population among the 16-35 in ECHP over the period 1994-2001. HMR is the degree of procedural formalism due to Balas et al (2009). The variable has been averaged over seven years and centered around its period mean.

Figure 1, though based on a small number of countries, suggests that the employment rate is negatively correlated with the HMR index. Young workers struggle to find jobs in countries where the rental market is very regulated. The relationship linking the two variables implies the raw elasticity of youth employment with repect to the HMR index is slightly lower than one.

Figure 2 depicts the proportion of emancipated youth against the HMR index. The youth emancipation rate measures the percentage of individual, aged between 16-35 years in ECHP, who do not live

with parents. The OLS line is strictly decreasing, suggesting that young persons living in countries where the rental market is very regulated quit the family home very late. Quantitatively, the raw elasticity of youth emancipation to HMR is unitary.

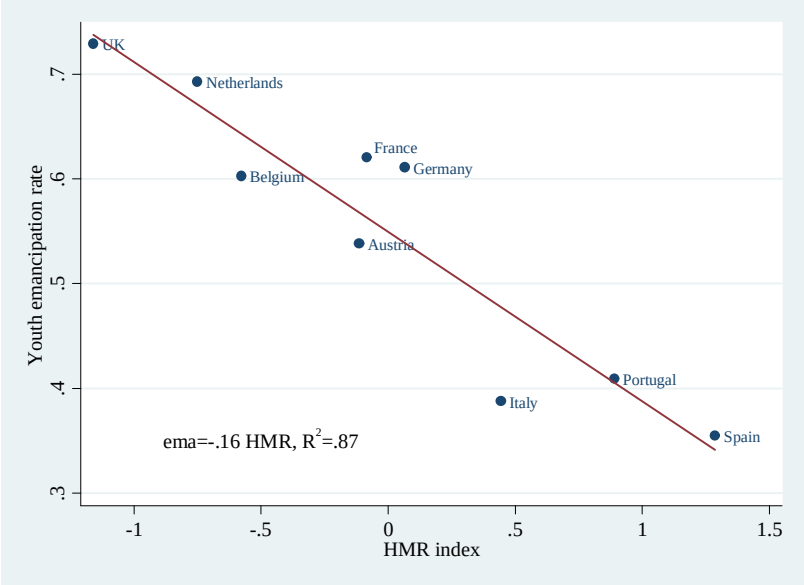


Figure 2: Youth emancipation and HMR in Europe. The youth emancipation rate measures the percentage of individual, aged between 16-35 years in ECHP, who do not live with parents. HMR is the degree of procedural formalism due to Balas et al (2009). The variable has been averaged over seven years and centered around its period mean.

Figure 3 shows the proportion of young employees in a temporary job over total youth employment against the OECD strictness index of EPL on regular employment. The share of 15-24 employees in a temporary job are given by OECD. The Figure 3 displays a positive correlation: young workers are more likely in short-term jobs in countries that strongly protect long-term jobs.

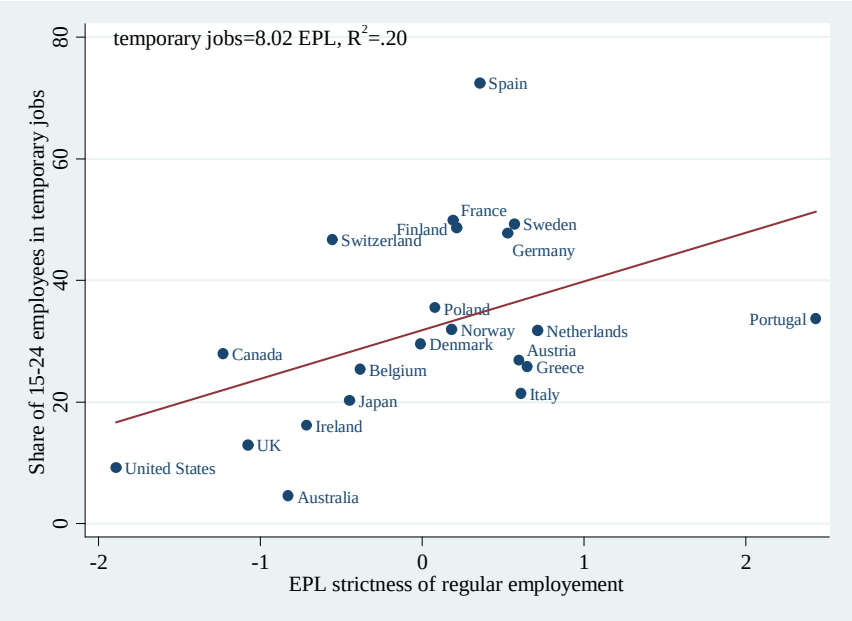


Figure 3: Share of young employees in temporary employment vs EPL on regular jobs in OECD countries, 1994-2001. The share of young employees is computed from OECD data and averaged over seven years. The EPL variable has been averaged over seven years and centered around its period mean.

Figure 4 is taken from Decreuse and van Ypersele (2011). It plots an index of EPL strictness due to Allard (2005) against the HMR index for OECD countries. The two variables are strongly positively correlated. Decreuse and van Ypersele show this correlation is robust to the consideration of country fixed effects.

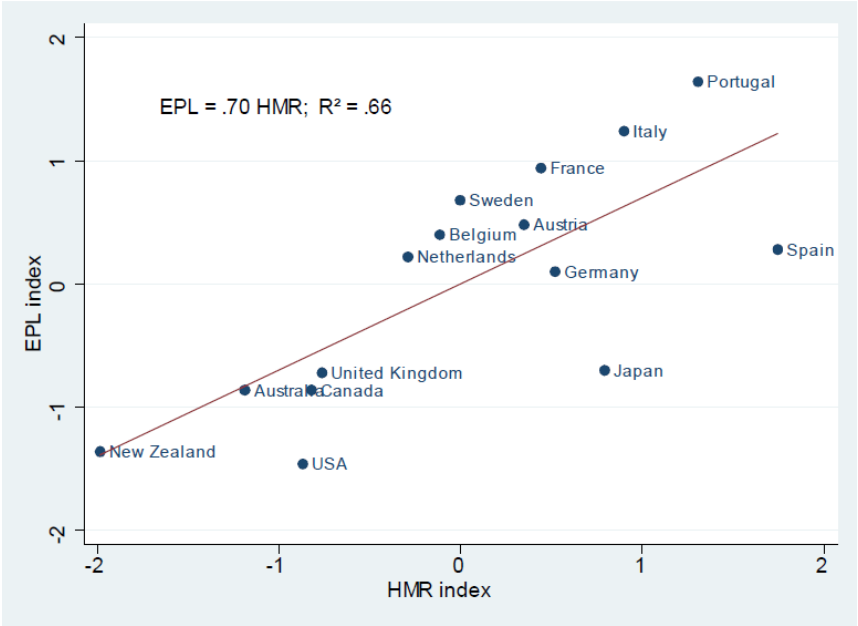


Figure 4: The relationship between HMR and EPL, 1995-2000. The two variables have been averaged over five years and centered around their period means. Source: Decreuse and van Ypersele (2011).

2.2 Micro evidence

To go beyond the partial correlations reported above, we turn to micro data and follow Kahn (2010) who evaluates the impacts of labor contract reforms on employment with the ECHP. This allows us to check which correlation is robust to the consideration of country fixed effects and to the consideration of regulations in alternative markets. The identification strategy exploits the heterogenous timing of reforms in Europe during the 1990s. The ECHP follows different households over one to eight years between 1994 and 2001. As individuals are observed several times, we can account for all time-invariant characteristics by including individual fixed effects. Given the country of residence belongs to such characteristics, individual fixed effects also contain country-specific cultural biases.

Kahn shows that reforms facilitating temporary contracts do not affect employment and increase the probability of having a temporary contract conditional on employment. By contrast, reforms of permanent contracts have stronger effects on employment. These results are robust to a number of control variables but do not resist the introduction of country-specific trends. Having this limit in mind, we adapt Kahn's approach to (i) the simultaneous consideration of EPL and HMR reforms and (ii) the modelling of both employment and emancipation.

Kahn registers changes in country-specific laws affecting dismissals for regular jobs and the use of temporary employment. He builds two reform variables, one for long-term (LT) contracts and the other one for short-term (ST) jobs. In both cases, the variable starts from 0 and does not change in the

absence of reform, one is substracted when the reform implies stricter protection, and one is added when the reform softens protection. There are fourteen episodes of reforms, with eight liberalizing the use of temporary employment, one restricting it, three reducing protection for LT jobs, and two increasing it.

We complete the dataset by including the HMR index. The remaining sample includes Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain and the UK[2]. There is substantial heterogeneity between countries. However, the index does not vary much within countries. Most of identification relies on four main changes that occured in three countries: France, Italy and the UK. There also more minor changes, for a total of 11 episods of modifications.

Kahn considers all individuals in the ECHP as well as a subsample of young workers below 25. We focus on a slightly different group of workers, the 16-35 population who exited the schooling system. The choice of the age span is suggested by the data: the mean age of emancipation varies across countries and reaches 31 in Italy. The share of emancipated individuals stabilizes at 35, which justifies our choice. We exclude individuals who are in education for endogeneity concerns. As this choice is arbirary, we report in the Appendix estimates for different samples: all young individuals including people in education, and different age groups. The results are qualitatively similar.

For individual i as of year t, the employment probability and the individual probability of being in a LT contract conditional on employment are

$$\begin{aligned} \text{emp}_{it} &= \alpha_i + \beta_t + x'_{it}\gamma + \delta_{LT}\text{reform}^{LT}_{j(i)t} + \delta_{ST}\text{reform}^{ST}_{j(i)t} + \delta_{HMR}\text{HMR}_{j(i)t} + \varepsilon_{it}, & (1) \\ \text{ltc}_{it} &= a_i + b_t + x'_{it}c + d_{LT}\text{reform}^{LT}_{j(i)t} + d_{ST}\text{reform}^{ST}_{j(i)t} + d_{HMR}\text{HMR}_{j(i)t} + e_{it}, & (2) \end{aligned}$$

where emp= 1 when the individual is employed and 0 otherwise and ltc= 1 when the individual is in a LT job and 0 when in a ST job. Parameters α_i and a_i are individual fixed effects, β_t and b_t are time dummies common to all individuals, x_{it} is a vector of individual characteristics and possibly time-varying characteristics, and the three reform variables have been described previously. Lastly, we consider the contemporaneous impact of the HMR index but also its delayed effect by including the 3-year lagged index. The differences with Kahn are the consideration of HMR and the 16-35 population excluding individuals in education.

In the spirit of the employment and contract type equations, we also model the individual probability of emancipation (ema) and the individual probability of renting (rent) conditional on being emancipated:

$$\begin{aligned} \text{ema}_{it} &= \alpha_i + \beta_t + x'_{it}\gamma + \delta_{LT}\text{reform}^{LT}_{j(i)t} + \delta_{ST}\text{reform}^{ST}_{j(i)t} + \delta_{HMR}\text{HMR}_{j(i)t} + \varepsilon_{it}, & (3) \\ \text{rent}_{it} &= a_i + b_t + x'_{it}c + d_{LT}\text{reform}^{LT}_{j(i)t} + d_{ST}\text{reform}^{ST}_{j(i)t} + d_{HMR}\text{HMR}_{j(i)t} + e_{it}. & (4) \end{aligned}$$

The emancipation regression is a reduced form. It does not take into account individual income or labor contract though these variables certainly affect the access to the housing market and vary over time. However, they are likely endogenous. For instance, firms may offer LT contracts to facilitate access to rentals (we develop this argument in section 3.2). Therefore these variables are replaced by their determinants.

[2] There are other countries in the ECHP, i.e., Austria, Greece, Finland, Ireland, Luxembourg and Sweden, but one of the two reform variables or the HMR index are not available for such countries.

	a	b	c	d
dependent variable	emp	ltc	ema	rent
reform^{LT}	0.0659***	0.0950***	0.0207***	0.0052
	(5.62)	(7.42)	(3.78)	(0.62)
reformST	0.0061	-0.0136*	-0.0043	-0.0042
	(1.02)	(-1.78)	(-1.12)	(-0.39)
HMR$_t$	-0.0067	0.0092	-0.0437***	-0.1250***
	(-0.27)	(0.29)	(-3.6)	(-4.67)
HMR$_{t-3}$	0.0487	-0.0271	-0.1626***	-0.4022***
	(0.89)	(-0.30)	(-6.44)	(-4.08)
within R^2	0.0188	0.0427	0.0847	0.048
N	175,387	87,067	175,487	120,100

Table 1: The impacts of EPL and HMR on youth employment, access to LT jobs, emancipation and access to rentals. Significance thresholds: * p<0.1, ** p<0.05, *** p<0.01. The t statistics are between parentheses. The variable reform^{LT} increases when the procedures and costs involved in dismissing individuals or groups of workers in long-term contracts are softened. The reformST variable increases when the procedures involved in hiring workers on fixed-term or temporary work agency contracts become less constraining. All regressions include individual fixed effects, time effects / age, and time-varying individual-specific controls (a dummy equal to one when the individual is 16-25, another dummy equal to one when the individual is a woman and aged 16-25, and the interaction of the latter variable with a country-specific dummy). Each observation is weighted using the ECHP sampling weights. Standard errors are clustered at the country-year level.

Table 1 shows the results. Column a shows that the typical reform of permanent contracts increases the employment probability by 7 percentage points, whereas column b shows that it raises the share of LT contracts in overall employment by 10 points. By contrast, reforms of temporary contracts have smaller effects on employment, and tend to increase the share of ST contracts in overall youth employment. Changes in contemporaneous or lagged HMR have no impacts on youth employment outcomes: neither the employment probability nor the access to LT contracts seem affected by HMR.

Columns c and d highlight the spectacuar negative impacts of HMR on emancipation and access to the rental market. This impact is more pronounced for the lagged regressor than for the contemporaneous one. Decreasing the French mean value of the index over the sample to the UK one would be associated to an increase in emancipation by 15 percentage points. Of course, such a shock is enormous and unseen at country level during the sample period. Meanwhile, labor contract reforms are weakly associated to these variables, if any. Reforms of ST contracts are never statistically significant, whereas reforms of LT contracts only have a positive and significant impact on emancipation.

Our results can be summarized as follows. When we account for individual fixed effects, reforms of LT contracts are strongly positively associated with youth employment and LT employment, whereas they are much less correlated with youth emancipation. Meanwhile, HMR is strongly negatively correlated with youth emancipation and access to rentals, whereas it is uncorrelated with youth employment. Table A1 in the Appendix shows these results qualitatively hold when the youth population accounts for individuals in

education, though HMR seems more negatively correlated with youth employment. The panel of Figures A2 to A7 displays the different estimated parameters and their 95% confidence intervals for different age groups (Figures A2 to A5), and when individuals in education are included in the sample (Figures A6 and A7). We progressively increase the lowest age or decrease the largest age defining the youth population. These figures do not alter the general findings reported here. However they suggest there is additional heterogeneity between age groups of young individuals. Lastly, like Kahn (2010), the results are not robust to country-specific trends. This result is not surprising given the small numbers of years and reform episods. However, it forbids a causal interpretation of the different parameters.

The purpose of the rest of the paper is to make sense of such aggregate correlations and micro-based facts. In the next section we present a model where job protection can be seen as a second-best technology transmitting labor market signals to landlords who face a lemon problem. The value of such signals increases with the rental market regulation, which explains why the society has strong preference for job protection despite its side effects on ST employment and overall youth employment.

3 Theory

We develop a model of the labor and housing markets for young workers. This model features a social demand for job protection based on the extent of procedural formalism affecting judicial disputes in the rental market. We first expose the basic model and then turn to various extensions.

3.1 Basic model

We consider a static economy peopled by identical individuals. All individuals start unemployed and live with their parents. The model has two blocks. In the labor market block, workers and firms meet and the worker-firm pair receives an initial signal on the match quality. The worker is then hired in a short-term or long-term contract based on this signal and on the stringency of EPL. In the housing market, landlords observe workers' contracts and screen them on the basis of expected job security. Then the match quality is revealed and the worker stays in the job or goes back to unemployment. In case of job loss, tenants default on the rent and landlords incur a loss due to the length of litigation and eviction procedures. The proportion that is lost is exogenous, and measures the degree of HMR.

We proceed in four steps. We first specify the model agenda and then successively present the labor market and rental market blocks. After discussing the comparative statics properties of equilibrium, we finally turn to the study of preferred job protection.

Timing.—In a first stage, individuals search for jobs. Firms choose whether they offer a long-term contract (LT) or a short-term one (ST). In a second stage, workers search for a dwelling and landlords screen them according to their contract type. In a third stage, match quality is revealed, and some jobs turn nonprofitable. Only those who stay employed pay the rent and enjoy housing consumption.

To simplify, wages and rents are exogenous. This assumption can be justified as representing additional

rigidities at work in the housing and labor markets. More interestingly, it abstracts from any second-order effect of job protection on prices, so that the social demand for EPL, if any, cannot be attributed to such disputable effects. For instance, Leonardi and Pica (2013) exploit the 1990 Italian reform that introduced unjust dismissal costs for firms below 15 employees. They find that the slight average wage reduction induced by the reform hides highly heterogenous effects. In a similar spirit, Casas-Arce and Saiz (2010) argue that procedural formalism in the rental market has heterogenous effects on rents by redistributing income from movers to stayers.

Labor market. There is a continuum of firms. Each firm corresponds to a single job slot, which can be active or inactive. Turning active costs $c > 0$. Vacant jobs and unemployed workers meet according to a matching technology. Let θ be the ratio of vacant jobs to unemployed workers. The probability of meeting a firm is $m(\theta)$, whereas the probability of contacting a worker is $m(\theta)/\theta$, with $m(\theta) = 0$, $m(\infty) = 1$, $m' > 0$, $m'' < 0$, and $m'(0) = 1$. The strict concavity implies that $m(\theta)/\theta$ is strictly decreasing, while the Inada-type condition ensures that $\lim \lim_{\theta \to 0} m(\theta)/\theta = 1$ by l'Hôpital's rule.

Right after meeting, the firm-worker pair receives a signal on match quality. The match is good with probability P and bad with complementary probability $1-P$. The probability P is uniformly distributed on $[0,1]$. Firms make two decisions: whether to hire the worker or not, and, conditional on hiring, which contract they offer. The contract type is indexed by $i = ST, LT$. Contracts differ in two ways: on the one hand, they are associated to different costs of dismissal. The firing cost $t_i \geqslant 0$ is a pure loss to the pair and $t_{LT} = t \geq t_{ST} = 0$. On the other hand, contracts differ in training opportunity: only the workers hired in a LT contract can receive training. Workers in a bad match are dismissed in all circumstances, while workers in a good match produce y_L when untrained, and $y_H > y_L$ when trained. We assume the following parametric restrictions hold: $y_H - w > y_L - w > 0$ and $w > 1$. Moreover, we denote $\Delta y \equiv y_H - y_L$ the output differential between good and bad matches.

The trade-off is the following: a LT contract is more costly than a ST contract because the firm has to pay a cost in case of separation. However, offering a LT contract is advantageous because trained workers can be more productive. This advantage can be exploited when the match is good. Thus the value of offering a LT contract increases with the signal on match quality.

The assumption whereby LT jobs are more productive than ST ones ensures firms have incentive to offer LT jobs. Note, however, that workers in temporary jobs are less likely to receive training (see, e.g., Booth et al, 2002). More generally costly commitment favors match-specific investments, which this assumption broadly captures.

Let π_{LT} and π_{ST} denote the profits associated with a LT and a ST contracts. We have

$$\pi_{LT} = P(y_H - w) + (1-P)(0-t), \tag{5}$$

$$\pi_{ST} = P(y_L - w). \tag{6}$$

The worker obtains a LT contract when

$$P \geq P_{LT} = \frac{t}{\Delta y + t},$$

and a ST contract when

$$P_{LT} > P \geq 0. \tag{7}$$

Figure 5 represents the choice made by the firm as a function of the initial belief P on match quality. This belief is on the horizontal axis, whereas the expected profit lies on the vertical axis. The expected profit associated to a ST contract starts from 0 when the job is surely of low quality and the worker is fired with certainty. Then it increases to $y_L - w$ when $P = 1$. The expected profit associated to a LT contract starts negative because $t \geq 0$. Then it crosses the horizontal line for some P, crosses π_{ST} in P_{LT} and reaches $y_H - w$ when $P = 1$. Thus the firm gives a ST contract when $P \in [0, P_{LT})$ and a LT contract when $P \geq P_{LT}$. When $t = 0$, $P_{LT} = 0$ and all workers are hired in a LT contract; when t is arbitrarily large, P_{LT} tends to 1 and all workers are hired in a ST contract.

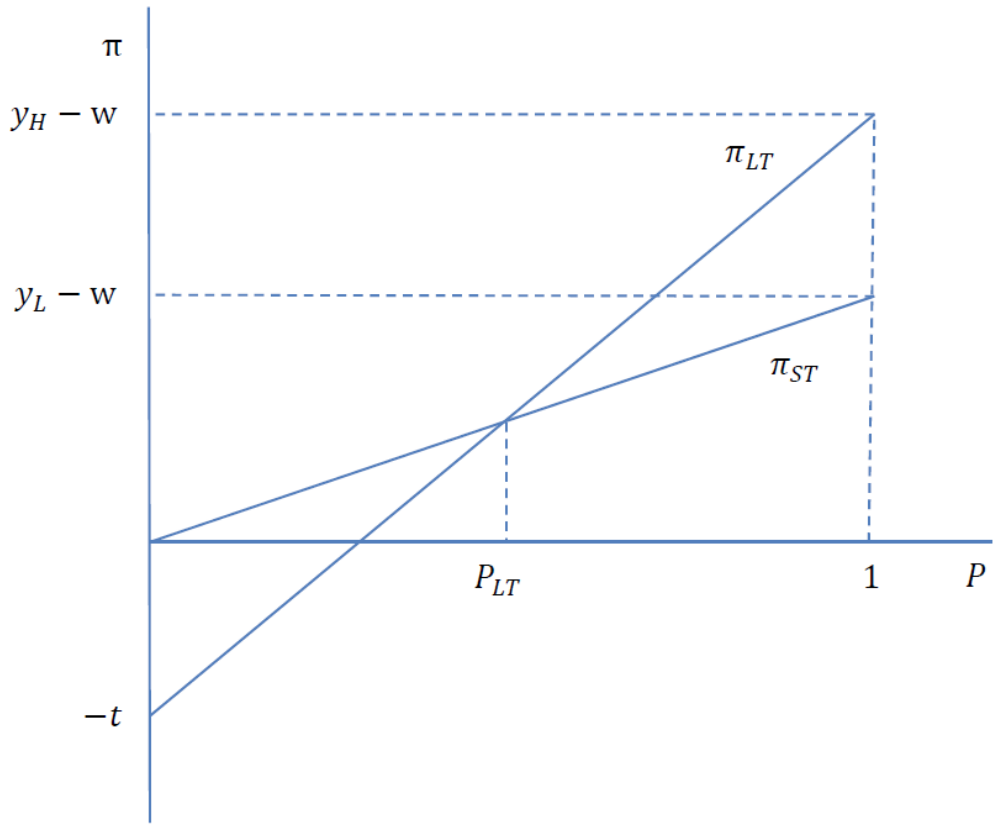


Figure 5: Contract choice and belief on match quality

The number of active jobs responds to a free-entry condition. This implies that

$$c = \frac{m(\theta^*)}{\theta^*} \int_0^1 \max\{\pi_{LT}, \pi_{ST}, 0\} dP. \tag{8}$$

Accounting for the two belief thresholds detailed above, we have

$$\begin{aligned} c &= \frac{m(\theta^*)}{\theta^*} \left\{ \int_0^{P_{LT}} \pi_{ST} dP + \int_{P_{LT}}^1 \pi_{LT} dP \right\} \\ &= \frac{m(\theta^*)}{\theta^*} \left\{ \Delta y \frac{1 - P_{LT}}{2} + (y_L - w) \frac{1}{2} \right\}. \end{aligned} \tag{9}$$

Rental market.—Once they have a job offer, which happens with probability $m(\theta^*)$, all workers search for a dwelling. We consider the simple case where each worker meets one and only one landlord. The expected income derived from renting to a type-i tenant is $(1-\delta_i)+(1-\alpha)\delta_i = 1-\alpha\delta_i$, where the rent is normalized to unity, δ_i is the expected default probability and $1-\alpha \in [0,1]$ is the value of the dwelling with a defaulting tenant. Parameter α is a measure of HMR. Procedural formalism weakens property rights and landlords cannot recoup the full value of the dwelling in case of rent default. When $\alpha = 0$, the expected income of the landlord is equal to one and does not depend on the default probability.

To screen applicants, landlords observe the employment contract. The contract type reveals an average match quality on the labor market which is $(1+P_{LT})/2$ for LT contract and $P_{LT}/2$ for ST contract. The corresponding default probabilities δ_{LT} and δ_{ST} are:

$$\delta_{LT} = \mathbb{E}[1-P \mid P \geq P_{LT}] = 1 - \frac{1+P_{LT}}{2}, \tag{10}$$

$$\delta_{ST} = \mathbb{E}[1-P \mid P < P_{LT}] = 1 - \frac{P_{LT}}{2}. \tag{11}$$

These default probabilities are such that $1/2 \leq \delta_{LT} < \delta_{ST} \leq 1$.

Each landlord has an opportunity cost of renting k, which is distributed according to the cumulative distribution function H. Landlords compare this opportunity cost to the expected income derived from renting $1-\alpha\delta_i \in [1/2,1]$. Therefore we suppose that the support of the cdf H is $[1/2,1]$. Moreover, this function has a continuous density $h \equiv H'$. Landlords expect that workers in ST jobs are more likely to be dismissed and, therefore, to default on the rent. Importantly, the reason is not that LT contracts protect workers against the risk of dismissal. Instead, the contract type reveals the match-specific risk of dissolution.

The probability μ_i of obtaining a rental varies with the contract type $i = ST, LT$. Indeed, we have $\mu_i = H(1-\alpha\delta_i)$. The probability decreases with the parameter of regulation α and the default probability δ_i. As $\delta_{LT} < \delta_{ST}$, we have $\mu_{LT} > \mu_{ST}$ when $\alpha > 0$ and workers with a LT contract are more likely to find a dwelling than workers with a ST contract.

Comparative statics.—We now discuss the impacts of the different regulation parameters on model outcomes. In this goal, let $e_{LT} = m(\theta^*)\Pr[P \geq P_{LT}]\mathbb{E}[P \mid P \geq P_{LT}]$ be LT employment, $e_{ST} = m(\theta^*)\Pr[P < P_{LT}]\mathbb{E}[P \mid P < P_{LT}]$ be ST employment and $e = e_{ST} + e_{LT}$ be overall employment. Similarly, the fraction of emancipated workers is $q = e_{ST}\mu_{ST} + e_{LT}\mu_{LT}$.

Taking into account the values of δ_{LT}, δ_{ST}, μ_{LT} and μ_{ST}, we have

$$\begin{aligned} e_{LT} &= m(\theta^*)\frac{1-P_{LT}^2}{2}, \\ e_{ST} &= m(\theta^*)\frac{P_{LT}^2}{2}, \\ e &= \frac{m(\theta^*)}{2}. \end{aligned}$$

The meeting probability $m(\theta^*)$ strictly decreases with t. An increase in the dismissal cost is equivalent to an increase in expected labor costs. Job profitability decreases and firms create fewer vacancies as a

result. The dismissal cost affects the threshold belief on match quality as follows:

$$\frac{dP_{LT}}{dt} = \frac{y_H - y_L}{(y_H + t - y_L)^2} > 0.$$

When the cost of dismisall t increases, firms substitute ST jobs to LT ones. Therefore the threshold P_{LT} goes up.

It follows that $de_{LT}/dt < 0$, whereas de_{ST}/dt has an ambiguous sign. LT employment necessarily decreases because the contact probability $m(\theta^*)$ goes down and firms become relunctant to offer LT contracts. The impact on ST employment is less clear-cut because firms have stronger incentive to hire workers in a ST contract. As $e = m(\theta^*)/2$, overall employment decreases with t.

As for the emancipation probability q, we have

$$\begin{aligned} q &= m(\theta^*)\left[(1-P_{LT})(1-\delta_{LT})\mu_{LT} + P_{LT}(1-\delta_{ST})\mu_{ST}\right] \\ &= \frac{m(\theta^*)}{2}\left[\left(1-P_{LT}^2\right)H\left(1-\alpha/2+\alpha P_{LT}/2\right) + P_{LT}^2 H\left(1-\alpha+\alpha P_{LT}/2\right)\right]. \end{aligned} \tag{12}$$

Emancipation results from the conjonction of three events: finding a job, keeping the job and finding a rental. HMR has a negative impact on emancipation. The second line separates the emancipation probability into two components: the employment probability $e = m(\theta^*)/2$ and the average probability $\bar{\mu} \equiv \left(1-P_{LT}^2\right)H\left(1-\alpha/2+\alpha P_{LT}/2\right) + P_{LT}^2 H\left(1-\alpha+\alpha P_{LT}/2\right)$ of obtaining a lease. Whether the individual has a LT or a ST contract, α reduces the likelihood that the landlord selects any worker. Therefore both probabilities μ_{LT} and μ_{ST} decrease with parameter α and so $\bar{\mu}$ decreases with α.

Optimal job protection.—We now argue there may be positive demand for protected jobs despite employment and the share of ST jobs increase with the firing cost t. We suppose that consumption and emancipation are complementary goods. In this model capital owners receive a constant return. Moreover landlords' and workers' well-beings are perfectly aligned. Therefore, the cost of dismissal maximizes the expected utility of a typical worker before the signal P is known, i.e., under the veil of ignorance. Therefore the optimal job protection parameter solves

$$t^* \in \arg\max_{t\geq 0}\left\{q(w-1) = e(t)\bar{\mu}(t,\alpha)(w-1)\right\}. \tag{$*$}$$

As $w-1$ does not depend on t, solving $(*)$ is equivalent to maximizing the emancipation probability.

Employment decreases with t. Thus $t = 0$ is the employment-maximizer level of job protection and $e_{\max}$ is the corresponding employment level. In the absence of rental market regulation, i.e., $\alpha = 0$, the optimal dismissal cost is $t^* = 0$. To see this, let us write the emancipation probability as follows: $q = e\mu_{ST} + e_{LT}(\mu_{LT} - \mu_{ST})$. When $\alpha = 0$, landlords are as likely to rent to workers in ST and LT contracts, i.e., $\mu_{LT} = \mu_{ST} = H(1) = 1$. Maximizing the emancipation probability is then equivalent to maximizing employment.

When $\alpha > 0$, landlords must take into account the default probability because they lose part of the dwelling's value in case of default. Suppose $t = 0$, then all workers are hired in a LT contract. It follows that the emancipation probability is $q = e_{\max}H(1-\alpha/2)$. As α increases, the probability of being accepted by the landlord goes down, reaching its minimum when $\alpha = 1$. In this latter case, the

probability is $H(1/2) = 0$. The unconditional mean of the default probability is too low for landlords who suffer the risk of losing their dwelling in case of default. Therefore they do not rent and the rental market collapses.

Setting $t^* > 0$ is optimal when $\alpha = 1$. This leads firms to select a subset of workers in LT contracts. The belief threshold P_{LT} is strictly positive and the mean default probability δ_{LT} among such workers is larger than 1/2. It follows that there is a mass of landlords who are willing to rent their dwellings to workers in LT contracts. Meanwhile, all workers in ST contracts are forced to coreside with parents.

By continuity, the optimal cost of dismissal for LT jobs is strictly positive when α is sufficiently large. In an interior solution to problem $(*)$, the optimal cost of dismissal solves the following first-order condition

$$\frac{e'(t^*)}{e(t^*)} + \frac{\bar{\mu}_t(t^*, \alpha)}{\bar{\mu}(t^*, \alpha)} = 0. \tag{13}$$

The first term accounts for the negative marginal impact of job protection on employment. The second term shows the marginal impact of job protection on the average probability of obtaining a lease. This term must be positive to balance the employment effect.

The second term is

$$\bar{\mu}_t(t^*, \alpha) = \underbrace{-2P_{LT}\frac{dP_{LT}}{dt}(\mu_{LT} - \mu_{ST})}_{A<0} + \underbrace{(1 - P_{LT}^2)\frac{dH(1 - \alpha/2 + \alpha P_{LT}/2)}{dt}}_{B>0} + \underbrace{P_{LT}^2\frac{dH(1 - \alpha + \alpha P_{LT}/2)}{dt}}_{C>0}.$$

It is composed of three effects, A, B and C. According to A, increasing the cost of dismissal reduces the pool of LT workers who benefit from a better access to rentals. Therefore this effect contributes to reducing the average probability of having a lease. According to B and C, the increase in cost of dismissal raises the probability of obtaining a rental for both ST and LT workers. This phenomenon is due to composition effects in both groups. The marginal workers who quit the group of LT workers have the lowest belief on match quality in this group, but the largest one in the group of ST workers. Therefore the mean expected risk of default decreases in both groups. These effects explain why protecting jobs may be interesting for nonemployed workers despite the negative impact of job protection on employment opportunities.

HMR promotes the social demand for job protection. The value of screening increases with the regulation parameter α. In heavily regulated rental markets, young workers are in favor of a legislation that reduces the supply of vacancies, increases unemployment and raises the proportion of ST employment despite the legislation does not affect the individual risk of job loss. The reason is HMR creates a need for a technology helping landlords to screen heterogenous applicants on the basis of their ability to pay the rent.

To conclude, the model equilibrium generically replicates the nexus of aggregate and micro facts discussed in section 2. In particular, emancipation and employment are negatively correlated with HMR as in Figures 1 and 2, the proportion of ST jobs increases with job protection as in Figure 3, and HMR and job protection are positively correlated as in Figure 4. Meanwhile, as in Tables 1 and 2, HMR does not directly affect labor market outcomes and reduces youth emancipation, whereas job protection on regular jobs reduces youth employment and increases the share of youth employees in temporary jobs.

3.2 Extensions

In this section we study three extensions to the basic model. We start with the consideration of effects of job protection on individual dismissal as Decreuse and van Ypersele (2011). Therefore job protection both increases selection into LT jobs and reduces the individual job loss probability. These two complementary views of job destruction and job protection strengthen each other and contribute to increasing the demand for job protection. We then consider the case where reducing worker mobility increases unemployment. We focus on an extreme situation where occupying a job always involves moving to a new dwelling. Despite firms take into account the effect of the labor contract on the rental probability, selection into employment is too low. Protecting LT jobs make firms more selective, which may improve employment and emancipation. Lastly, we revisit the insider-outsider theory of job protection. We let the probability of success P ex-ante differ in the population. We show two groups of workers prefer strongly protected jobs: individuals with a large probability of success and those with a low probability of success. The former want to belong to a small elite club with large access to the housing market, whereas the latter want to be accompanied in short-term contracts by as many workers as possible to avoid stigmatization.

Job protection and the risk of dismissal.—In the basic model, the individual risk of dismissal is not affected by EPL. The average risk of dismissal among LT workers decreases with job protection for pure composition effects as in Pries and Rogerson (2005) and Cahuc et al (2016). There is another strand of literature based on Mortensen and Pissarides (1994) where employed workers are submitted to idiosyncratic productivity shocks and job protection reduces the individual probability of dismissal. We now account for both types of effects, i.e., composition and individual effects.

With probability $1-P$ the firm incurs an operative loss $-\pi$, where π is drawn from the cdf G on the support $(0,\infty)$. Workers occupying a ST job are always dismissed in such a case, whereas workers in a LT contract are dismissed when $\pi > t$. The threshold belief P_{LT} solves $P_{LT}(y_L - w) = P_{LT}(y_H - w) - (1-P_{LT})f(t)$, where $f(t) = -\int_0^t \pi dG(\pi) - [1-G(t)]t$. This gives $P_{LT} = f(t)/(\Delta y + f(t))$. The free-entry condition still implies

$$c = \frac{m(\theta^*)}{\theta^*}\left\{\Delta y \frac{1-P_{LT}}{2} + (y_L - w)\frac{1}{2}\right\},$$

whereas ST, LT and overall employment are

$$\begin{aligned} e_{LT} &= \frac{m(\theta^*)}{2}[1 - P_{LT}^2 + (1-P_{LT})^2 G(t)], \\ e_{ST} &= \frac{m(\theta^*)}{2} P_{LT}^2, \\ e &= \frac{m(\theta^*)}{2}\left[1 + (1-P_{LT})^2 G(t)\right]. \end{aligned}$$

Like the basic model, the cost of dismissal distorts the allocation of ST and LT contracts. Therefore this cost reduces the supply of vacancies and increases the share of ST contracts. However, now it also reduces the individual job loss probability for workers with a LT contract. Therefore the overall effect of t on employment is ambiguous.

Landlords make their decision on the basis of the following average default probabilities: $\delta_{LT} = (1-P_{LT})[1-G(t)]/2 < 1/2$ and $\delta_{ST} = 1 - P_{LT}/2$. The cost of dimissal still induces risk selection into

ST and LT employment, which decreases both default probabilities. Moreover it further decreases the average LT workers' default probability by reducing the individual risk of dismissal.

The emancipation probability is

$$q = \frac{m(\theta^*)}{2}\left\{H(1-\alpha\delta_{LT}) + P_{LT}^2(H(1-\alpha\delta_{ST}) - H(1-\alpha\delta_{LT})) + H(1-\alpha\delta_{LT})(1-P_{LT})^2 G(t)\right\}.$$

When $\alpha = 0$, the emancipation probability is $q = eH(1)$. Therefore the optimal cost of dismissal maximizes employment. When $\alpha = 1$, people have two reasons to set job protection above the employment-maximizer parameter. On the one hand, job protection improves screening like in the basic model. The transmission of high-quality signals to landlords improves the access to rentals and makes emancipation easier. On the other hand, the cost of dismissal reduces the individual default risk of workers in LT contracts. This further increases their chance of obtaining a rental. This latter effect is similar to Decreuse and van Ypersele (2011) who study the impact of job protection on mortgage prices.

HMR increases the return to job security through two complementary effects: improved screening reduces the magnitude of landlords' asymmetric information problem and decreased individual risk of job loss lowers the correlated risk of rent default.

HMR, employment and workers' mobility.—In the basic model, the only effect of HMR on employment is due to the correlated demand for job protection. This is in line with the micro evidence reported in section 2, Table 1. However, Table A1 in the Appendix shows that HMR is negatively associated to youth employment when we consider a different sample of individuals. We now follow Rupert and Wasmer (2012) and introduce a direct effect of HMR on employment due to its negative impact on worker mobility. Accounting for this effect modifies the reasoning because, now, facilitating the access to rentals can also increase employment. We show that EPL is still needed as a firm discipline device to make them more selective and improve access to rentals.

To consider an extreme case, suppose that occupying a job requires moving from the family home to an alternative location. Therefore employment and emancipation coincide. Once a worker is met, the firm chooses the contract type accounting for the chance of having a rental. Offering a ST contract gives $P(y_L - w)H(1-\alpha\delta_{ST})$, whereas offering a LT contract gives $P(y_H - w)H(1-\alpha\delta_{LT}) - (1-P)t$.

The free-entry condition implies

$$c = \frac{m(\theta)}{\theta}\left\{\int_0^{P_{LT}} H(1-\alpha\delta_{ST})P(y_L - w)dP + \int_{P_{LT}}^1 [H(1-\alpha\delta_{LT})P(y_H - w) - t(1-P)]dP\right\} \tag{14}$$

and the threshold belief is

$$P_{LT} = \frac{t}{(y_H - w)H(1-\alpha\delta_{LT}) - (y_L - w)H(1-\alpha\delta_{ST}) + t}, \tag{15}$$

Firms take as given the group-specific mean default probability used by landlords to decide whether to accept a potential tenant or not. However, such default probabilities depend on firms' policies to offer ST and LT contracts. In equilibrium the selection threshold solves the following fixed-point problem:

$$P_{LT} = \frac{t}{(y_H - w)H(1-\alpha/2+\alpha P_{LT}/2) - (y_L - w)H(1-\alpha+\alpha P_{LT}/2) + t}. \tag{16}$$

When $\alpha = 0$, the probability of having a rental is equal to one for both groups of workers. Thus $P_{LT} = t/(\Delta y + t)$ as in the basic model. When $\alpha > 0$, the right-hand side of equation (16) is affected by P_{LT} in two opposite ways. Both mean default probabilities decrease with P_{LT}, which implies that both ST and LT workers are more likely to find a rental. The negative impact of P_{LT} on δ_{LT} is a stabilizer effect: an increase in P_{LT} raises LT workers' probability of obtaining a rental, which provides firms with incentive to offer LT contracts. Conversely, the negative impact of P_{LT} on δ_{ST} is a multiplier effect: increasing P_{LT} reduces firms' incentive to offer LT contracts.

Given the stabilizer and multiplier effects depend on the density H' of the opportunity cost distribution, it is possible to conceive cases where the latter effect dominates the former one. In other words, there may be multiple equilibria. In high-selection equilibria, few workers are hired in LT contracts and they easily find rentals, whereas the large pool of workers hired in ST contracts benefit from a moderate access to rentals. In low-selection equilibria, more workers are hired in LT contracts and they face more difficulties to find dwellings than in high-selection equilibria. Moreover, the smaller number of workers hired in ST contracts struggle to find rentals.

In equilibrium, firms under-select workers in LT jobs. One way to see this consists in maximizing firms' expected profits with respect to P_{LT} while accounting for its effects on the signals received by landlords. We obtain

$$\begin{aligned} P_{LT} &= \frac{t}{(y_H - w)H(1-\alpha/2+\alpha P_{LT}/2) - (y_L - w)H(1-\alpha+\alpha P_{LT}/2) + t} \\ &\quad -\alpha \frac{\frac{d\delta_{ST}}{dP_{LT}} h(1-\alpha\delta_{ST}) \int_0^{P_{LT}} P(y_L - w)dP + \frac{d\delta_{LT}}{dP_{LT}} \int_{P_{LT}}^1 h(1-\alpha\delta_{LT}) P(y_H - w)dP}{(y_H - w)H(1-\alpha/2+\alpha P_{LT}/2) - (y_L - w)H(1-\alpha+\alpha P_{LT}/2) + t} \\ &> \frac{t}{(y_H - w)H(1-\alpha/2+\alpha P_{LT}/2) - (y_L - w)H(1-\alpha+\alpha P_{LT}/2) + t}, \end{aligned}$$

because $d\delta_i/dP_{LT} < 0$ for $i = ST, LT$.

The first line of the right-hand side corresponds to the hiring threshold that firms set in the decentralized allocation. The second line accounts for the signal transmitted to landlords. Given P_{LT} decreases both group-specific rent default probabilities, the resulting threshold is larger than in equilibrium. The situation is typical of the prisoner's dilemma. It is in the collective interest of firms to restrict the supply of LT contracts so as to transmit high-quality signals to landlords. At private level, each firm has incentive to deviate from this strategy to make sure that the worker will find a rental and the job will be occupied. In equilibrium firms offer too many LT contracts, operating profits are too low and too few vacancies are supplied.

The optimal cost of dismissal still maximizes the emancipation probability, which is here equivalent to maximizing employment. Like the basic model, HMR promotes job protection because firms are insufficiently selective. We illustrate this statement by confronting two extreme cases. In the absence of HMR, landlords accept all potential tenants and the cost of dismissal reduces employment. Therefore the optimal cost is $t^* = 0$. Conversely, when $\alpha = 1$, having $t = 0$ implies that $P_{LT} = 0$. Firms do not select workers and the mean default probabilities are $\delta_{LT} = 1/2$ and $\delta_{ST} = 0$. Thus $\mu_{LT} = \mu_{ST} = 0$ and employment and emancipation are equal to 0. Thus $t^* > 0$.

In this extended model, employment and emancipation coincide. Therefore optimal job protection

actually maximizes employment. In the more general case where only a share of job offers require moving to an alternative location, there is still a trade-off between employment and access to rentals as in the basic model.

Insider-outsider theory of job protection.—Saint-Paul (2001) describes the insider-outsider theory of labor market institutions. This theory posits that existing institutions maximize the well-being of the majority of workers installed in LT jobs. In the basic model, we study the preferences of a typical individual under the veil of ignorance. However, it is obvious that the ex-ante risks of losing future jobs and defaulting on future rents differ in the youth population. We now consider the preferences of heterogenous individuals in terms of such risks. This leads us to distinguish two groups of persons who prefer strongly protected jobs: young workers with high and low risks of being dismissed.

Let $u_i = m(\theta^*)H(1-\alpha\delta_i)/2$ be the normalized utility when the worker can obtain a type-i contract, $i = ST, LT$. The utility U of a type-P worker depends on the belief threshold according to:

$$U = \begin{cases} Pu_{LT}(w-1) & \text{if} \quad P \leq P_{LT} \\ Pu_{ST}(w-1) & \text{if} \quad P > P_{LT} \end{cases}$$

When $\alpha > 0$, we have $\delta_{LT} < \delta_{ST}$. Therefore $u_{LT} > u_{ST}$ and all workers prefer LT contracts to benefit from better access to rentals. The function U jumps upward when the type P crosses the threshold P_{LT}.

The variable P_{LT} is monotonically increasing in t. Thus it is equivalent to analyze preferences vis-à-vis t or P_{LT}. We focus on P_{LT} with $t = \frac{P_{LT}}{1-P_{LT}}\Delta y$. For ease, we suppose that the functions u_{ST} and u_{LT} are single-peaked, taking their maximum in P^+_{ST} and P^+_{LT}, respectively. The corresponding costs of dismissals are t^+_{ST} and t^+_{LT}, with $t^+_{ST} = \frac{P^+_{ST}}{1-P^+_{ST}}\Delta y$ and $t^+_{LT} = \frac{P^+_{LT}}{1-P^+_{LT}}\Delta y$. Wheter P^+_{ST} is larger or lower than P^+_{LT} depends on the monotonicity of the ratio $h(x)/H(x)$ with respect to x.

Let $\bar{P}$ be the worker's type such that the person is indifferent between t^+_{ST} and t^+_{LT}. Since $H(1-\alpha\delta_{LT}) > H(1-\alpha\delta_{ST})$, this limit type is such that $\bar{P} < \min\{P^+_{LT}, P^+_{ST}\}$.

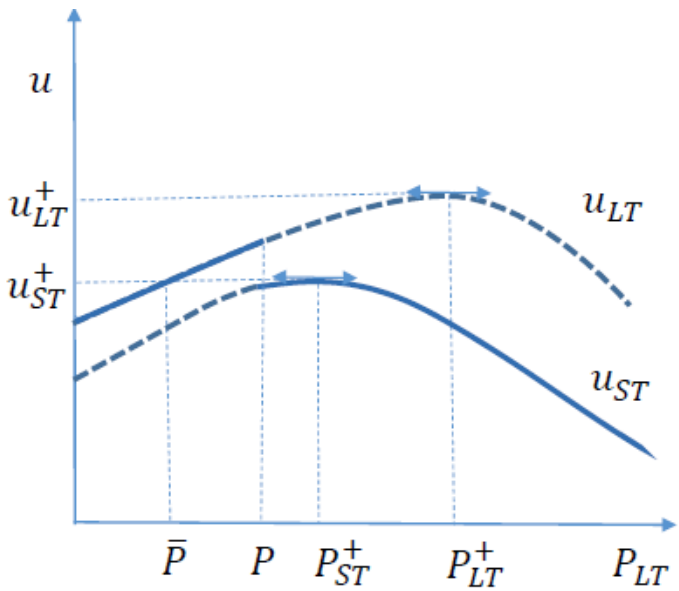


Figure 6: Preferred job protection when workers know their type. The normalized utility functions u_{ST} and u_{LT}, normalized utility maximizers P_{ST}^{+} and P_{LT}^{+}, and the limit type $\bar{P}$ are defined in the text. The bold line shows the normalized utility of a type P worker when P_{LT} changes.

Figure 6 depicts the normalized utility functions u_{LT} and u_{ST} when the threshold belief P_{LT} varies.

Large-P individuals, i.e., with $P \geq P_{LT}^{+}$, prefer the level of job protection maximizing the normalized utility associated to LT contracts. Such individuals are sure to become LT workers and incline for high selection into this group, thereby ensuring that landlords are willing to offer them a rental. The level of protection is only limited by its negative impact on job openings.

At the other bound of the type spectrum, low-P individuals, i.e., $P \leq \bar{P}$, prefer the level of job protection maximizing the normalized utility associated to ST contracts. This level can be substantially large for reasons symmetric to large-P individuals. Low-P individuals are sure to become ST workers. Therefore they want to be mixed with a pool of high types, which obtains when LT jobs are very selective.

Lastly, medium-P individuals, i.e., with $\bar{P} < P < P_{LT}^{+}$, want to become LT workers. Therefore they prefer the largest cost of dismissal that is compatible with their selection into the pool of LT workers, which implies $P_{LT} = P$.

Two conclusions can be drawn. First, large-P individuals and low-P individuals have similar interests for job protection. Both want the entry into LT jobs to be selective so that the mean default probabilities associated to their group are high. Second, the group of workers less attached to job protection is less homogenous. Each worker of this group wants a LT contract, but also wants to exclude lower P individuals belonging to the same group from LT jobs.

Alternative risks and markets.—Our arguments can actually be applied to alternative risks and markets. These risks must be correlated with the probability of long-term success in an employment relationship, whereas the market situation must involve a screening problem taking place after the labor contract choice. Consider first another risk specific to the rental market: the risk of damage to the dwelling due to tenant's negligence. Workers who lose their jobs do not necessarily damage the dwelling as a reaction to the job loss. However, the characteristics associated to being successful in a LT employment relationship may be correlated with the characteristics associated to caring a home. In such a situation, the labor contract vehicles a signal on the risk of damage. If housing regulation increases the loss incurred by the landlord in case of damage, then the value of the labor contract signal increases with job protection.

The market for properties offers a similar situation where the lender must assess the borrower's ability to repay the debt. The costs of litigation vary a lot across countries and frequently amount to significant proportions of property values. Lenders typically use the labor contract to screen potential borrowers. Here again, the value of this signal increases with the strictness of job protection. We do not insist on this case because the youth do not have a large access to the market for properties.

The marriage market provides another example where job protection is particularly useful to screen potential life partners. The divorce regulation increases the cost of divorce by reducing the utility obtained by each divorcee. Thus marriage candidates must assess the risk of divorce prior to accepting marriage proposals. The labor contract offers a signal on one's ability to maintain a solid marriage. There is evidence suggesting that the loss of a job increases the risk of marriage dissolution for purely informational reasons—and not for economic motives. Doiron and Mendolia (2011) study the rate of divorce following an involuntary job loss. Redundancies have much smaller impacts than dismissals and ends of temporary jobs. This is in line with the idea that the latter motives convey a signal on future earnings and marriage quality. Charles and Stevens (2004) show there is an increase in the probability of divorce following a spouse's job displacement but no change in divorce probability after a spousal disability. As they explain, this difference casts doubt on a purely pecuniary motivation for divorce following earnings shocks, since both types of shocks exhibit similar long-run economic consequences.

4 Conclusion

In many European countries, young workers are over-exposed to unemployment and job instability and quit the family home remarkably late. Meanwhile long-term jobs are very protected and the rental market is heavily regulated. Despite this situation calls for reforms of labor contracts, young workers are not willing to reduce protection of long-term jobs they do not hold. This paper provides a rationale to the lack of youth support for reforms of job protection. When the rental market is heavily regulated, protecting long-term contracts provides a screening technology improving access to the housing market. The risks of rent default and job dismissal are inherent to individuals and positively correlated. Employers who offer a long-term contract transmit a signal to landlords about the worker's type. The quality of this signal increases with the strictness of job protection.

Our paper calls for reforms of the housing market. Ideally one would like to reduce the level of

procedural formalism in case of disputes between landlords and tenants. However, it is hardly feasible to modify it independently from the rest of the judicial system. Therefore the most important reform consists of insuring landlords against the rent default. The cost of such insurance can be large in terms of moral hazard effects. A key benefit consists of weakening the political support for job protection, thereby opening the door to labor market reforms. In France, the recent launch of the Visale guarantee is a step in this direction. This guarantee against rent default is accessible to all individuals below 30 who are not in education[3] and individuals above 30 in short-term employment. It covers all rents until the end of the rental contract. Eligibility conditions are fairly weak: the rent cannot exceed 1500 euros per month in Paris and 1300 euros elsewhere and the rent-to-income ratio cannot exceed 50%. Visale is financed by Action-Logement, an institutional body related to the State. Therefore it is free for renters and landlords who plan to use it.

We focus on a particular set of regulations of the housing market, namely procedural formalism in case of disputes between landlords and tenants. Housing market institutions are less well known and measured than labor ones. There are other types of regulation that we abstract from and that may have different effects on the housing and labor markets as well as on the social demand for job protection. We plan to study these alternative sets of regulation in future work.

[3] Students who do not depend on parents' income and scholarship holders are also eligible.

References

Alesina, A., Algan, Y., Cahuc, P., Giuliano, P., 2015. “Family Values and the Regulation of Labor”, Journal of the European Economic Association 13, 599-630

Allard, G., 2005. "Measuring job security over time: in search of a historical indicator for EPL (Employment Protection Legislation)", Instituto de Empresa Working Paper 05-17

Algan, Y., Cahuc, P., 2006. "Job protection: the macho hypothesis", Oxford Review of Economic Policy 22, 390-410

Algan, Y., Cahuc, P., 2009. "Civic virtue and labor market institutions", American Economic Journal: Macroeconomics 1, 111-145

Andrews, D., Caldera-Sánchez, A. and Johansson, A., 2011. "Housing Markets and Structural Policies in the OECD," OECD Economics Department Working Papers No. 836

Balas, A., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2009. "The divergence of legal procedures", American Economic Journal: Economic Policy 1, 138-162

Blanchard, O., Tirole, J., 2008. "The joint design of unemployment compensation and employment protection: a first pass", Journal of the European Economic Association 6, 45-77

Booth, A.L., Francesconi, M., Frank, J., 2002. "Temporary jobs: stepping stones or dead ends?", Economic Journal 112, F189-F213

Botero, J., Djankov, S., La Porta, R., Lopez-De-Silanes, F., 2004. "The regulation of labor", Quarterly Journal of Economics 119, 1339-1382

Cahuc, P., Charlot, O., Malherbet, F., 2016. "Explaining the spread of temporary jobs and its impact on labor turnover", International Economic Review 57, 533-572

Casas-Arce, P., Saiz, A., 2010. "Owning versus renting: do courts matter?", Journal of Law and Economics 53, 137-165

Charles, K., Stephens, M., 2004. "Job displacement, disability and divorce", Journal of Labor Economics 22, 489-522

Cuerpo, C., Kalantaryan, S., Pontuch, P., 2014. "Rental market regulation in the European Union", European Economy, Economic Paper 515

Decreuse, B., van Ypersele, T., 2011. "Housing market regulation and the social demand for job protection", Journal of Public Economics 95, 1397-1409

Deng, Y., Quigley, J.M., Van Order, R., Mac, F., 1996. "Mortgage default and low downpayment loans: the costs of public subsidy", Regional Science Urban Economics 26, 263-285

Djankov, S., La Porta, R., Lopez-De-Silanes, F., Shleifer, F., 2003. "Courts", Quarterly Journal of Economics 118, 453-517

Doiron, D.J., Mendolia, S., 2011. "The Impact of Job Loss on Family Dissolution", Journal of Population Economics 25, 367-398

Eichholtz, P.M.A., 1995. "Regional economic stability and mortgage default risk in the Netherlands", Real Estate Economics 23, 421-439

Gerardi, K., Herkenhoff, K.F., Ohanian, L.E., Willen, P.S, 2015. "Can't pay or won't pay? Unemployment, negative equity, and strategic default", NBER Working Paper 21630

Kahn, L., 2010. "Employment protection reforms, employment and the incidence of temporary jobs in Europe: 1996-2001", Labour Economics 17, 1-15

Lazear, E., 1990. "Job Security Provisions and Employment", Quarterly Journal of Economics 105, 699-726

Leonardi, M., Pica, G., 2013. "Who pays for it? The heterogeneous wage effects of employment protection legislation", Economic Journal 123, 1236-1278

Nivière, D., 2006. "Les ménages ayant des difficultés à payer leur loyer", Etudes et Résultats, n° 534

Pries, M. and Rogerson, R., 2005. "Hiring policies, labor market institutions, and labor market flows", Journal of Political Economy 113, 811-839

Rupert, P. and Wasmer, E., 2012. "Housing and the labour market: time to move and aggregate unemployment", Journal of Monetary Economics 59, 24-36

Saint-Paul G., 2001. "Political economy of the labour market", Oxford and New York: Oxford University Press

Serrano-Diaz, L., 2005b. "Income volatility and residential mortgage delinquency across the EU", Journal of Housing Economics 14, 153-177

APPENDIX

We study the robustness of the econometric results presented in section 2. We first reproduce Table 1 with a different sample including individuals in education. We then consider different age intervals defining the youth population.

Table A1 reproduces columns a and c of Table 1 when the youth population includes all individuals in education. Columns b and d are not reproduced because they are unchanged. Table A1 confirms the results displayed by Table 1. On the one hand, labor market reforms do not affect emancipation and the access to rentals, whereas HMR strongly reduces rental opportunities. On the other hand, reforms of LT contracts increase the youth employment probability. The effect is quantitatively smaller than in Table 1, which is not surprising given many individuals in education do not stop schooling following a change in labor market conditions. The main difference with Table 1 is that HMR now reduces the employement probability (column a). This finding helps to motivate the second extension we propose in section 4.

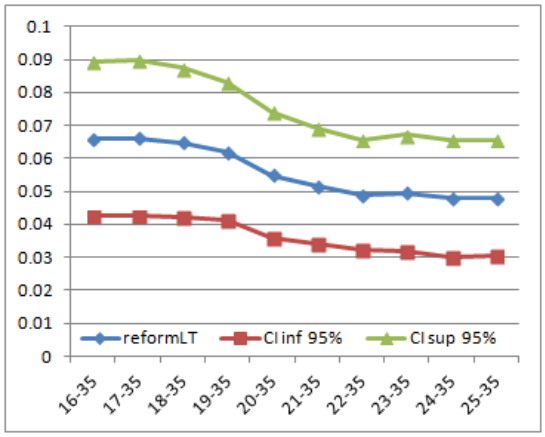
	a	b
dependent variable	emp	ema
reform^{LT}	0.0452***	0.0018
	(3.50)	(0.33)
reform^{ST}	0.0052	-0.0033
	(0.73)	(-0.70)
HMR_t	-0.0694**	-0.0299*
	(-2.15)	(-1.82)
HMR_{t-3}	-0.0199	-0.1211***
	(-0.44)	(-6.09)
within R^2	0.078	0.098
N	214,532	214,884

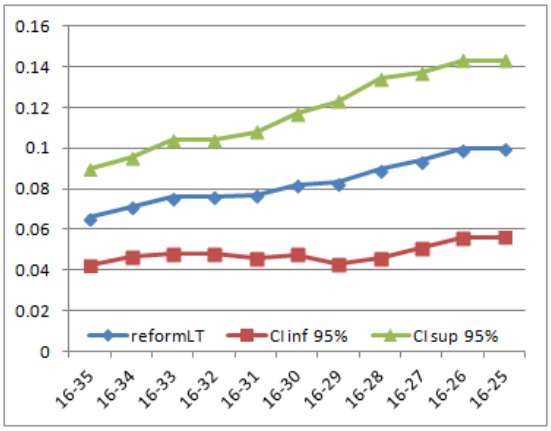
Table A1: The impacts of EPL and HMR on youth employment and emancipation. Significance thresholds: * p<0.1, ** p<0.05, *** p<0.01. The t statistics are between parentheses. All regressions include individual fixed effects, time effects / age, and time-varying individual-specific controls (a dummy equal to one when the individual is 16-25, another dummy equal to one when the individual is a woman and aged 16-25, and the interaction of the latter variable with a country-specific dummy). Each observation is weighted using the ECHP sampling weights. Standard errors are clustered at the country-year level.

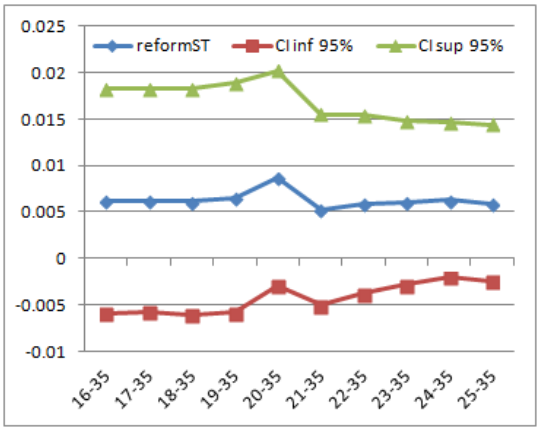
The panels of Figures A2 to A7 show the effects of the age span on the key parameter estimates. Each panel is associated to a specific dependent variable (emp, ltc, ema, rent), a particular definition of the youth population (including individuals in education or not including them), and a particular modification of the age interval (increasing lower bound or decreasing upper bound). Overall these figures show that the general findings reported in section 2 hold for these different subpopulations. In particular, reforms of ST contracts are not correlated with employment and emancipation, reforms of

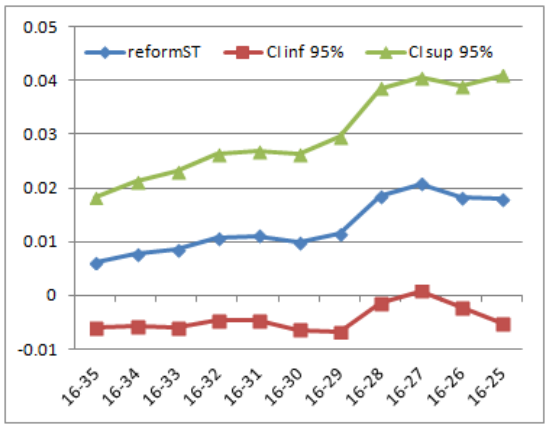
LT contracts are more correlated with employment than emancipation and HMR is more correlated with emancipation than employment. To deep into details, Figure A2 shows that reforms of LT contracts are more associated with the employment of younger workers, but Figures A6 suggest this is partly due to selection in education. Figures A3 and A7 reveal that reforms of LT contracts may have heterogenous effects on the emancipation probability of the different age groups (positive for older workers and negative for younger ones), though the overall effect is nil.

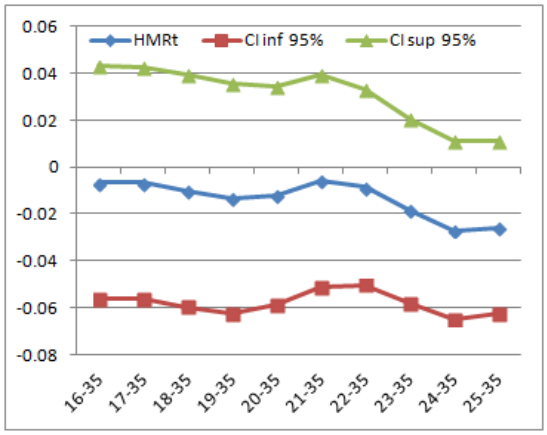
Figures A2: Estimated parameters of the employment regression for different age groups, case where individuals in education are excluded from the sample

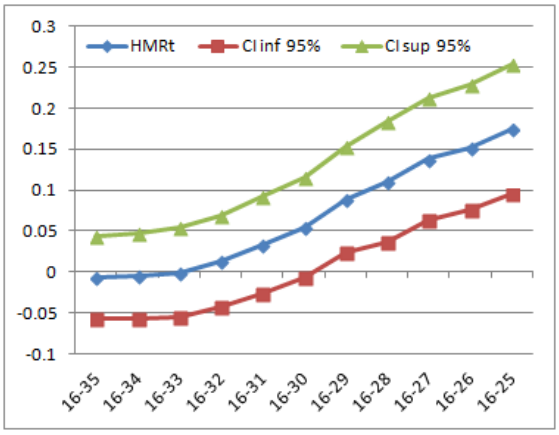


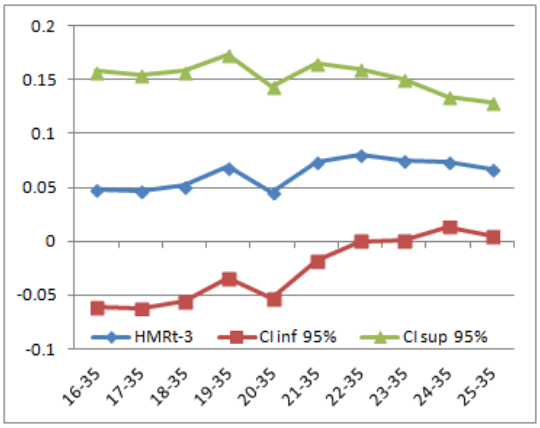


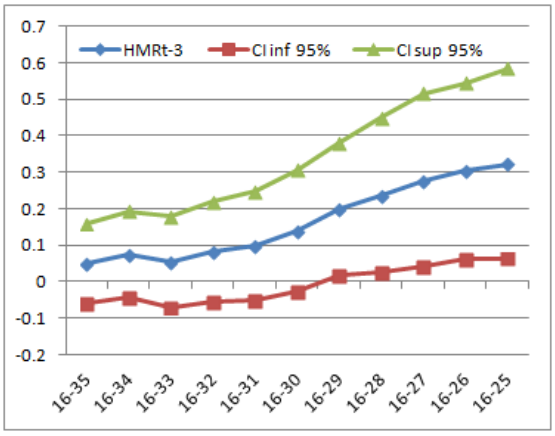




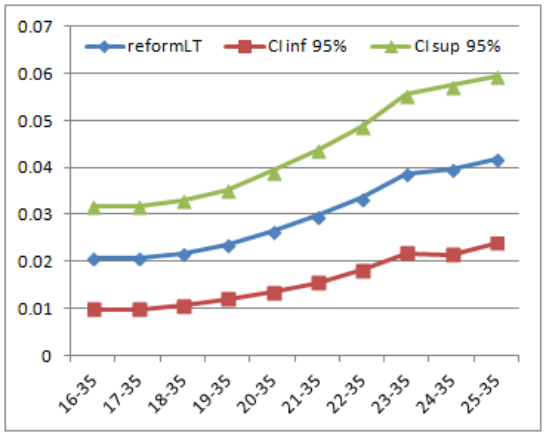


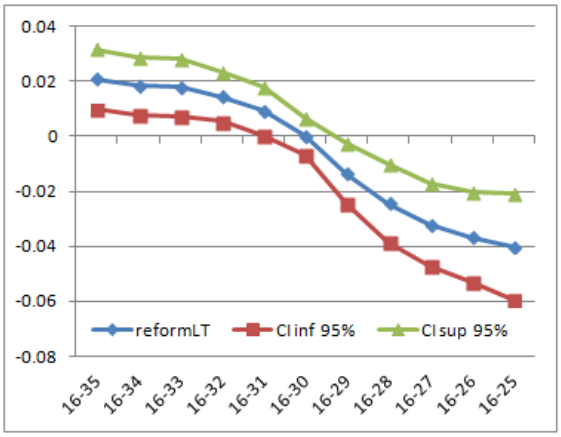


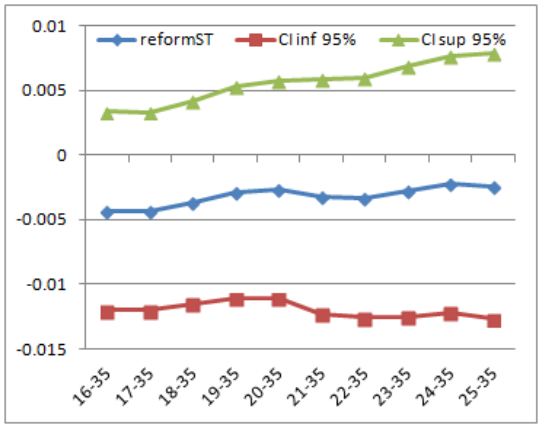


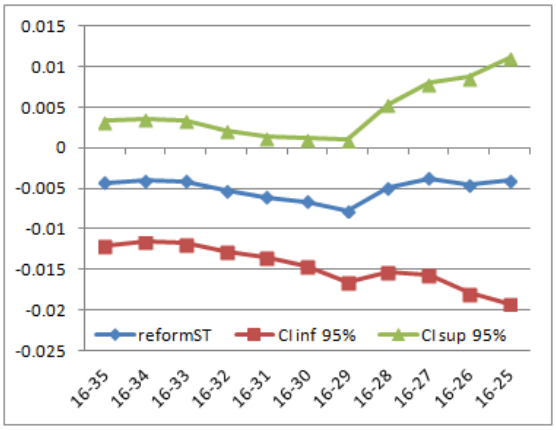


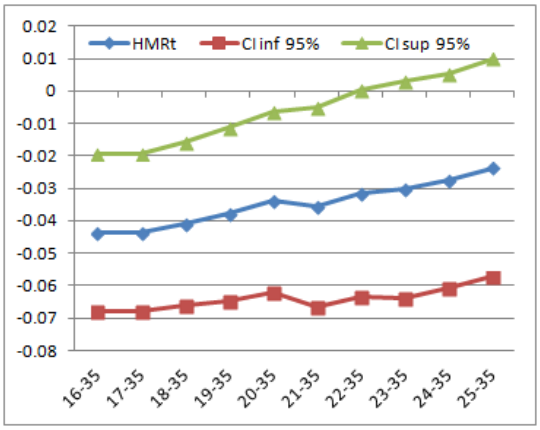
Figures A3: Estimated parameters of the emancipation regression for different age groups, case where individuals in education are excluded from the sample

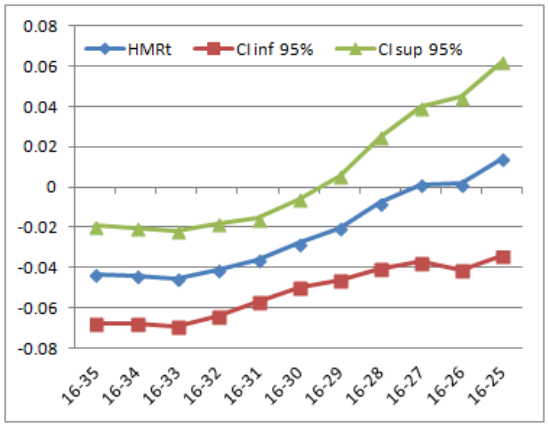


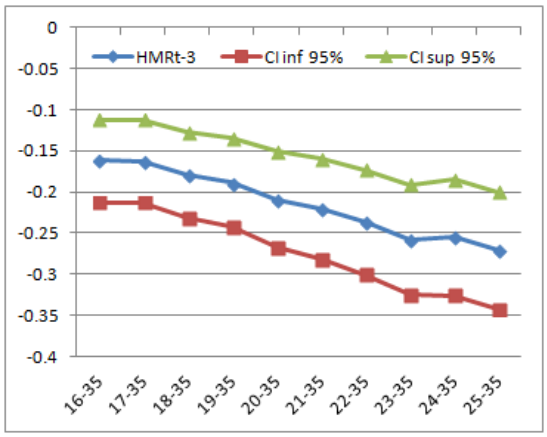


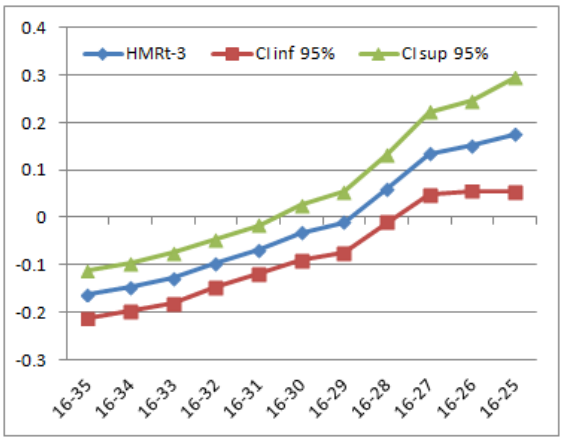




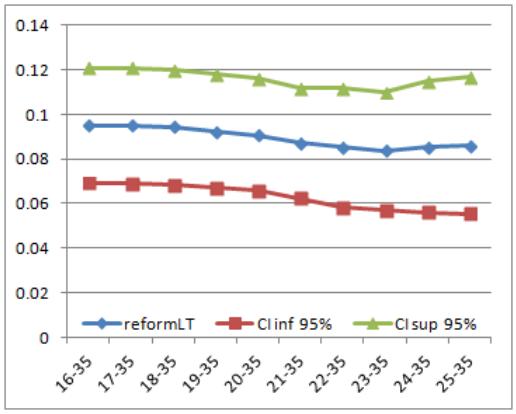


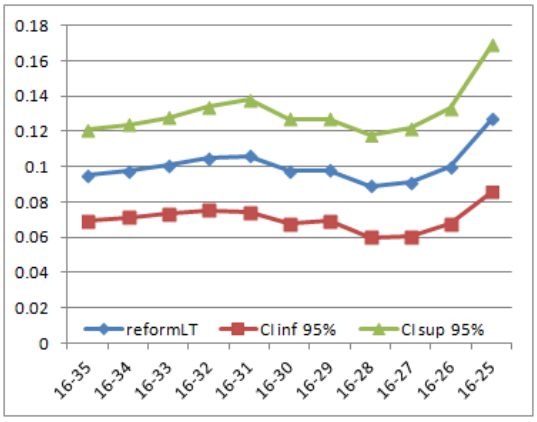


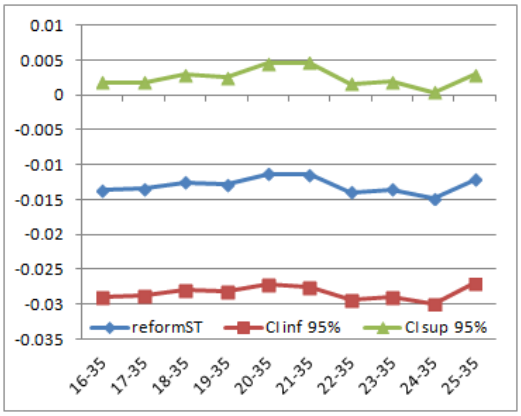


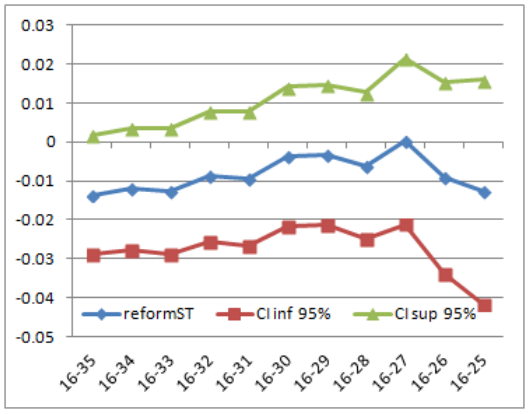


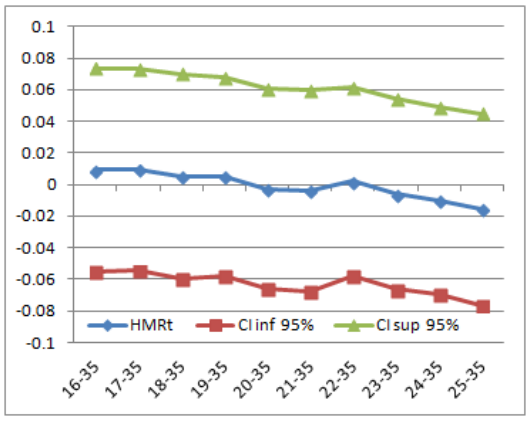
Figures A4: Estimated parameters of the ltc regression for different age groups, case where individuals in education are excluded from the sample

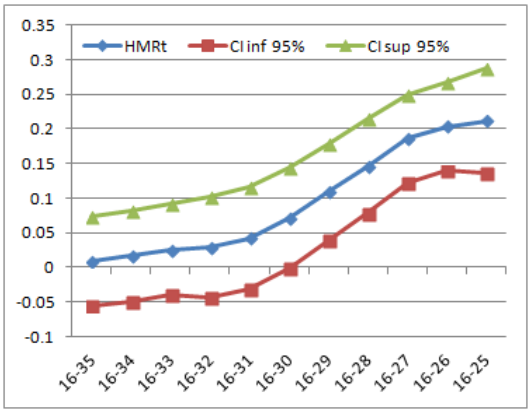


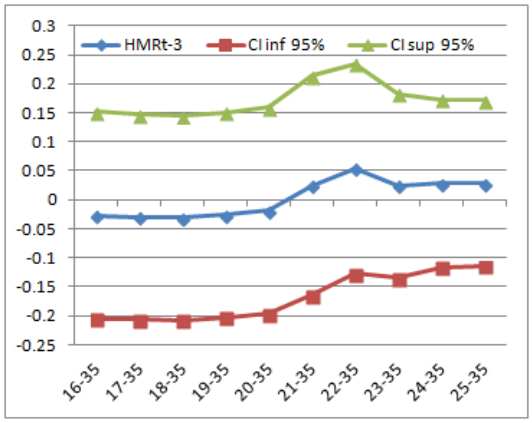


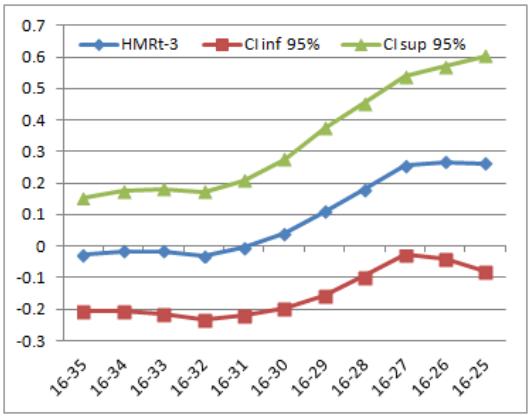




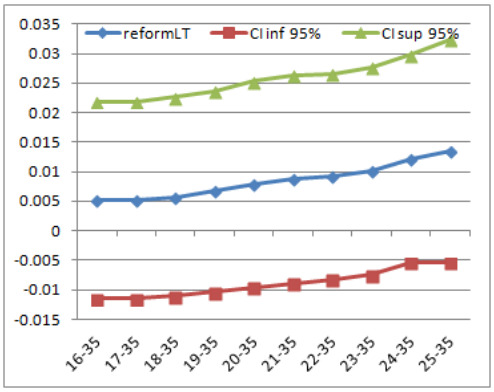


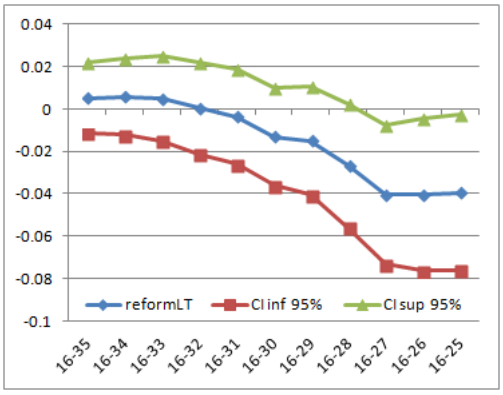


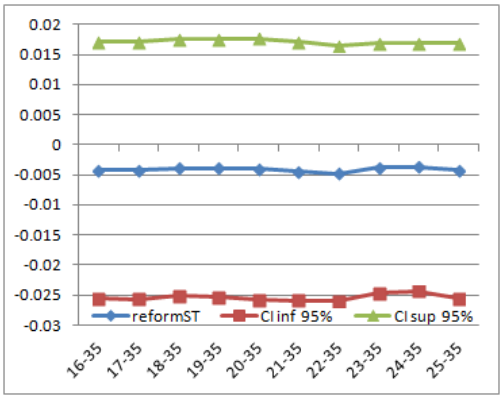


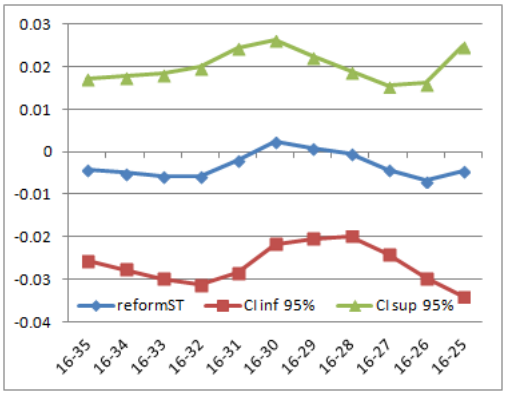


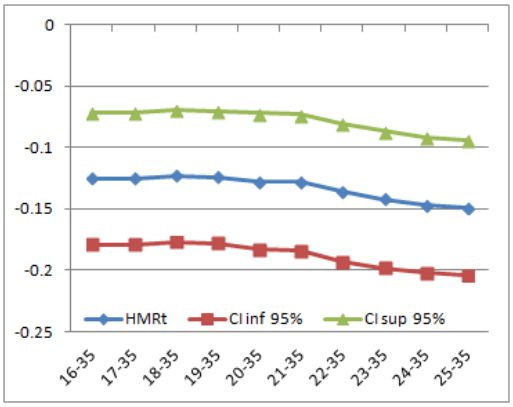
Figures A5: Estimated parameters of the rent regression for different age groups, case where individuals in education are excluded from the sample

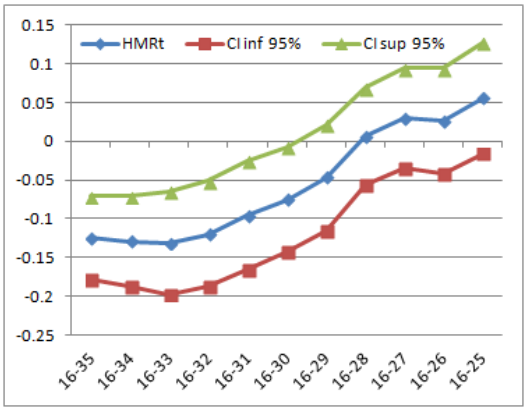


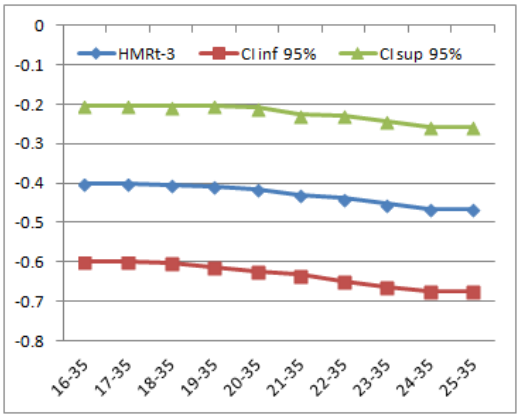


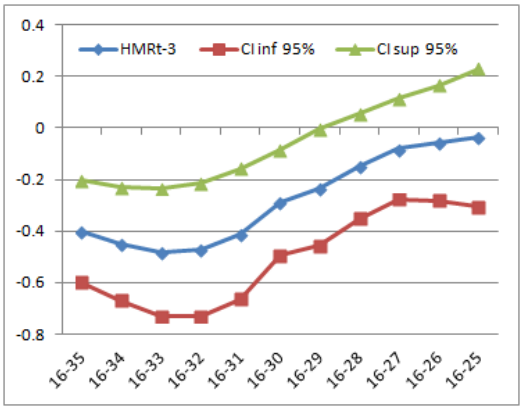




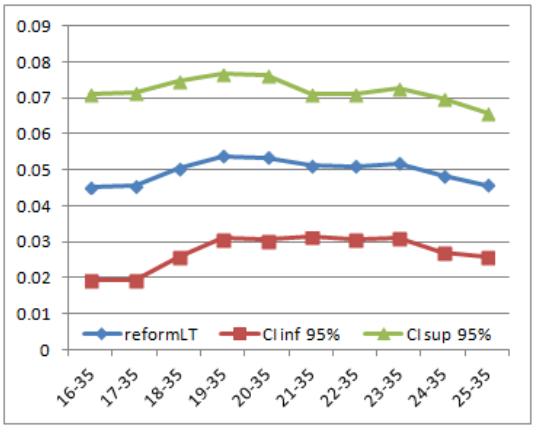


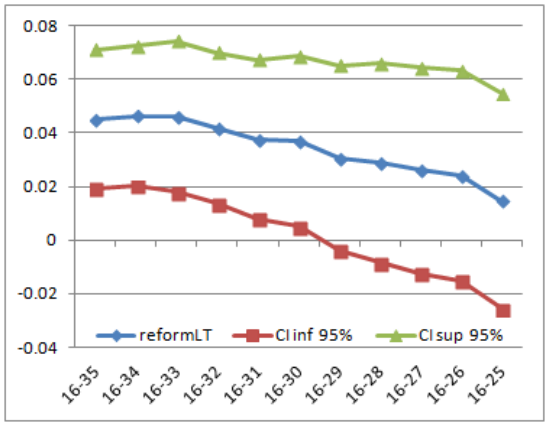


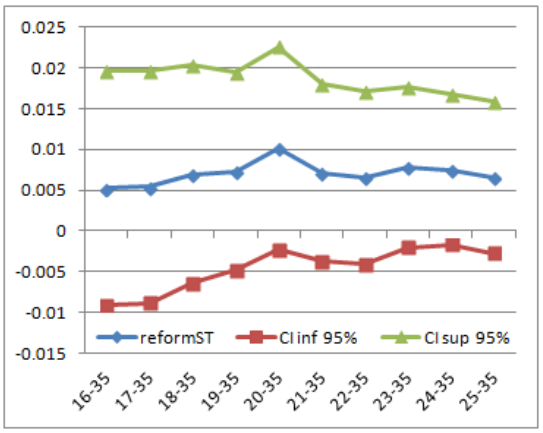


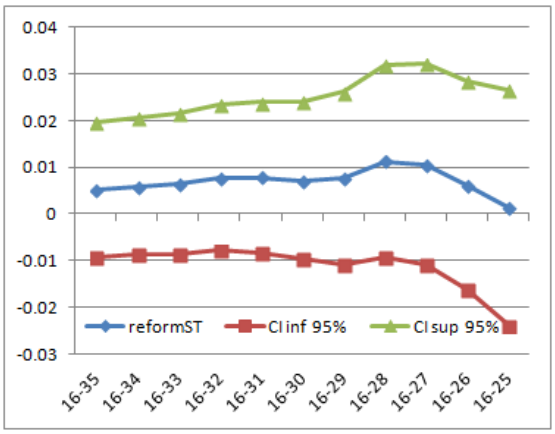


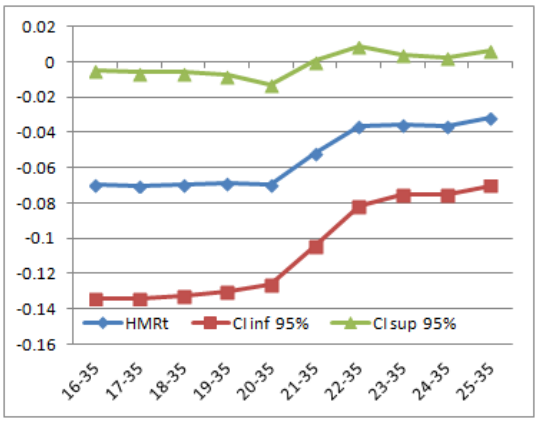
Figures A6: Estimated parameters of the employment regression for different age groups, case where individuals in education are in the sample

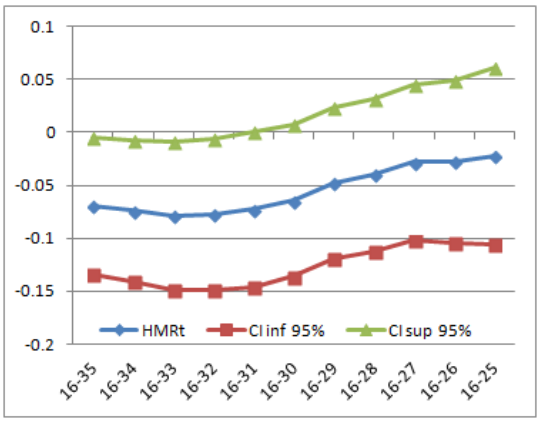


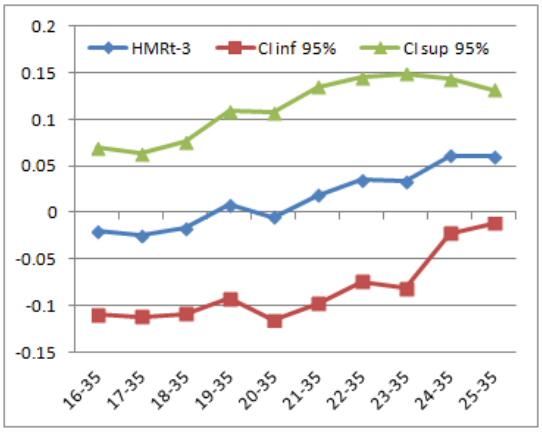


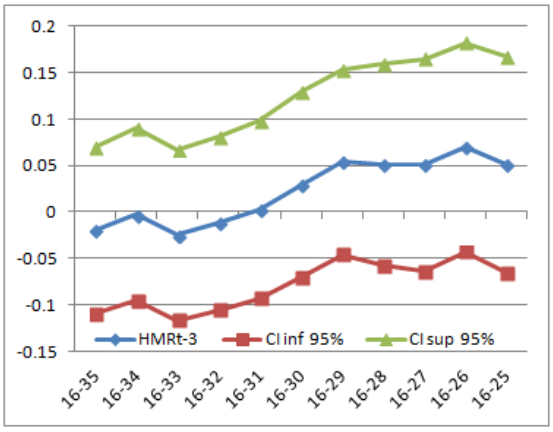
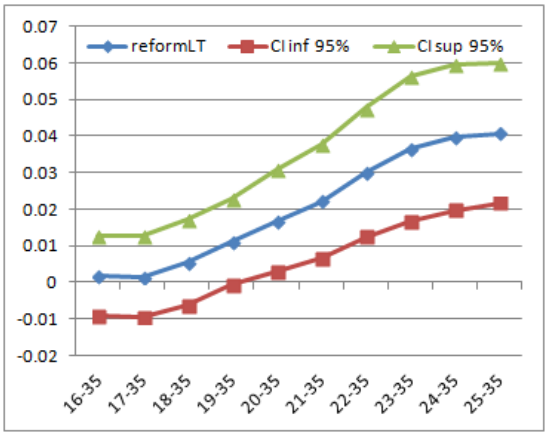
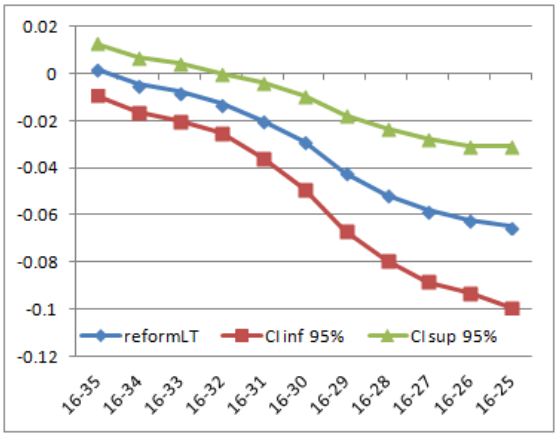
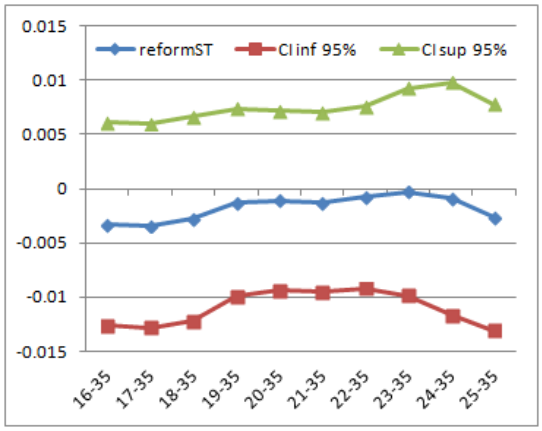
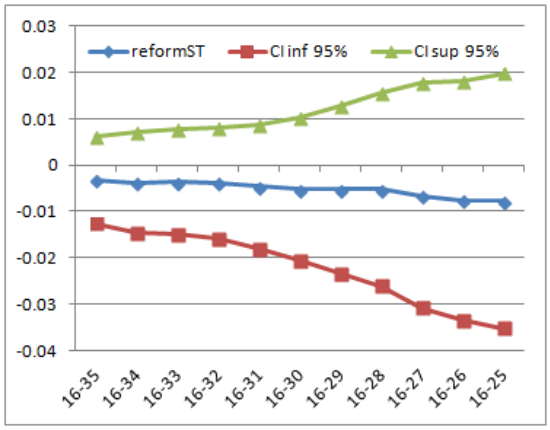
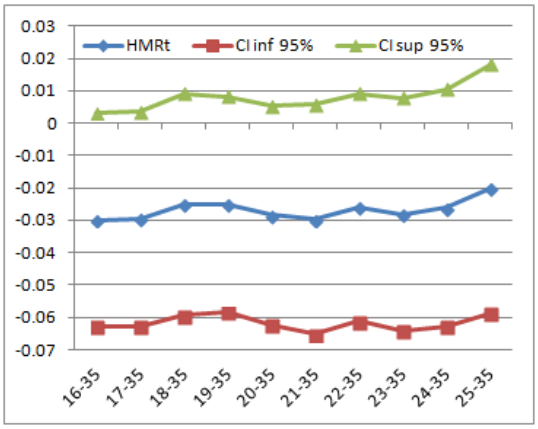
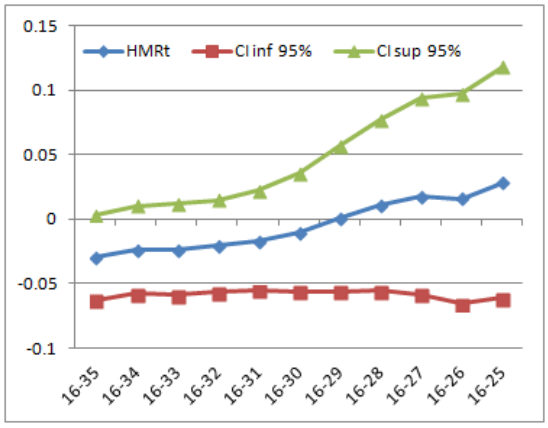
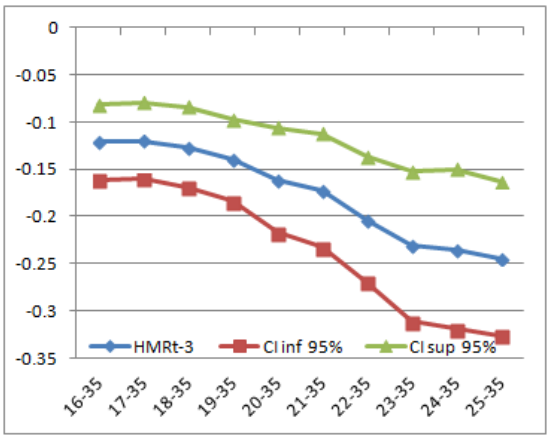
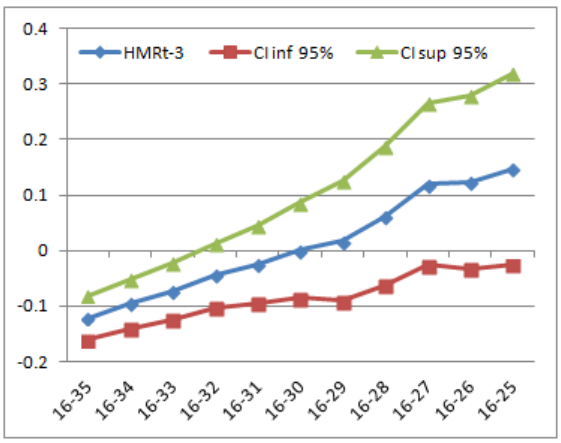












Figures A7: Estimated parameters of the emancipation regression for different age groups, case where individuals in education are in the sample