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# The Regulation of Residential Tenancy Markets in Post-War Western Europe: An Economic Analysis[1]

Juan S. Mora-Sanguinetti[2]

**Abstract**

This paper provides an economic analysis of the post-war regulation of European tenancy markets. Two representative types of market regulation are analyzed: the introduction of compulsory duration clauses in tenancy contracts (as a means of protecting the tenant against eviction); and rent control policies. First, the study describes and analyzes the recent history of such regulations in Spain, Italy, Finland and the UK, in order to draw some general conclusions about the evolution of European institutions in recent decades. Their effects are then explored by adapting a theoretical model of tenancy markets. The results show that both rent control and compulsory duration clauses potentially entail negative effects for European tenancy markets as they may drive some participants out of the market. These effects are consistent with the trends observed during the latter half of the 20th century in several European countries.

JEL Classification: R31, K12, N4.

Keywords: Rent control, Tenancy contracts, Compulsory terms

## 1. Introduction

In several European countries, the weight of the tenancy market relative to the total stock of principal residences has diminished throughout the 20th century. Figure 1 shows, using information held in public databases of the European central banks, recent evidence for 12 European countries.

Several explanations could be provided to understand that general trend, ranging from the finance literature, which considers housing as an investment good, to the more general housing economics literature that regards housing as a consumption good (see Henderson and Ionnides, 1983 and Rosen *et al.* 1984 for some early references). For instance, in recent decades improvements in access to credit and significant development of the financial markets (Iacoviello and Minetti, 2003, Kumbhakar and Lozano-Vivas, 2004, Blanco and Restoy, 2007) have occurred, which may have favored the property market. Some fiscal regimes have also privileged buying over renting of residences (see López-García, 1996, García-Vaquero and Martínez, 2005, for the case of Spain).

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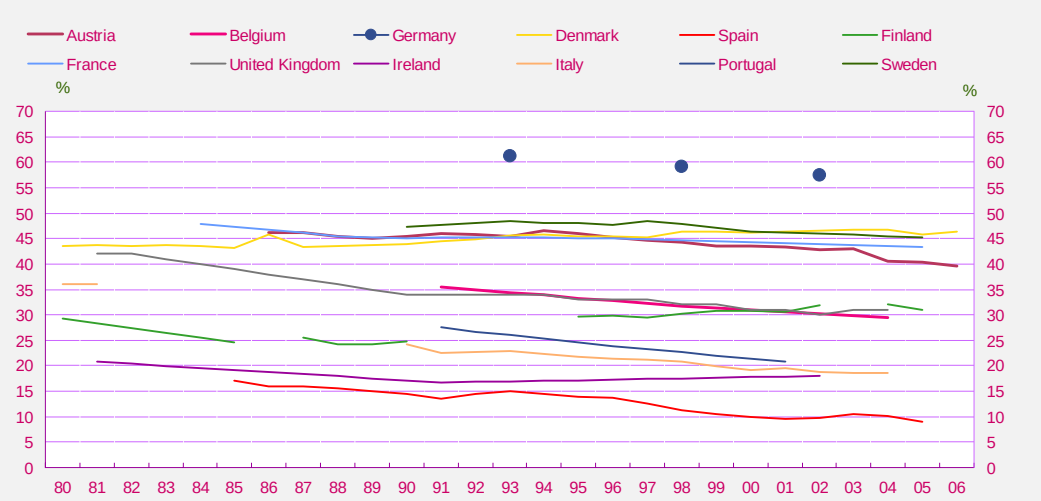
[2] Banco de España-Eurosystem & OECD. E-mail: juansmora@hotmail.com. The views expressed in this paper are entirely those of the author and should not be attributed to the Banco de España, the Eurosystem or the OECD.

*Figure 1: Share of rented dwellings in 12 EU countries*




*Source: ECB Statistical Data Warehouse (2007).*

Nevertheless, it is only some specialized literature which takes into account the effects of regulations and institutions of the tenancy market (other than fiscal policies), such as rent control clauses or periods of protection for tenants. A weak tenancy market and a diminishing rate of tenancy seem to be related, for instance, to the introduction of rent control policies. In this respect, the microeconomic intuition that relates a rent ceiling with a diminishing quantity and quality of residences in the tenancy market has been supported by several theoretical explorations (Basu and Emerson, 2000, Raess and Ungern-Sternberg, 2002, Basu and Emerson 2003) or empirical analyses (Johnson, 1951, Alston *et al.*, 1992, Glaeser and Luttmer, 2003, Sims 2007 among others).

However, most of the research on rent control has merely examined the type of market intervention enforced in local markets of the United States (for a summary, see Turner and Malpezzi, 2003). In contrast, less analysis has been made of the specific effects of European-style tenancy restrictions. Exceptions to that are Peña and Ruiz-Castillo (1984) for Spain, by Munch and Svarer (2002) for Denmark and by Lyytikäinen (2006) in respect of Finland.

Moreover, the regulations in force in various European countries impose not only rent control clauses but also clauses of protection term (duration clauses) against eviction. Both kinds of rules may have had an effect on the diminishing share of tenancy in very different economies. At the same time partially liberalizing laws, such as those adopted in the UK (England and Wales) and Finland, may have had the opposite effects.

The aim of this paper is to analyze the regulations specifically directed to the tenancy markets in Europe and to provide a theoretical exploration of their economic implications. The structure of this paper proceeds as follows: firstly, the paper identifies the most common market regulations affecting European tenancy contracts by analyzing the various national laws (section 2). Those regulations are then introduced in

a model of tenancy markets to explore their effects theoretically (section 3). Finally, the paper draws some conclusions based on the analysis carried out (section 4).

## 2. The regulation of housing tenancy markets in Europe

At the beginning of the 20th century, "contractual freedom" inspired the contents of tenancy contracts in several European countries, following the principle of the "autonomy" of private parties.[3] However, as the century progressed, "contractual freedom" was gradually restricted by the introduction of some tenancy regulations (such as rent ceilings, compulsory terms or control over the increase of the rent) which had the objective of improving the situation of tenants in the context of a shortage of rental housing stock following the First and Second World Wars (or the Civil War in the case of Spain).

If the analysis is limited to rent control policies, one can follow the classification made by Arnott (1998) of their different types into "two generations". A "first generation" rent control would include rent freezes and exceptional upward adjustments. A "second generation" rent control would include automatic percentage rent increases linked to the rate of inflation (or similar indices). While tenancy markets in the United States were gradually deregulated, with very few cities maintaining the controls after 1950, in Europe the first generation rent controls survived longer due to the long-lasting effects of the two World Wars. Arnott (1998) identifies the surge of the second generation controls with the inflationary crisis of 1973.

However, rent control is only one of the market regulations introduced in the European tenancy markets. In fact, "compulsory terms" are a mean of temporarily protecting the tenant against eviction. It is also possible to classify those regulations by their severity: the protection could be permanent, therefore rendering the duration of the contract subject to the will of the tenant, or temporary.

In this section, a detailed analysis is provided for Spain, as a benchmark, Italy, UK and Finland (the last three providing examples of countries that introduced relevant reforms in recent decades) and an overview of the most recent regulations for a multiplicity of European countries (see Table 1).

[3] This was the case, for instance, in Article 1255 of the Spanish Civil Code (1889) and Article 1322 of the Italian Civil Code (1942). Those articles followed the French tradition (Article 1134 of the French Civil Code, 1804).

**Table 1: Recent legal regimes governing tenancy contracts in Europe**

| COUNTRY | LAW in force during the period studied | DURATION | RENT | Other clarifications |
|---|---|---|---|---|
| Austria | ABGB (Civil Code) (1811) and MRG (1981) as a specific Statute | Minimum duration of 3 years | The rent and the rent increase are thoroughly regulated. The legislation sets the maximum rent at the time of the conclusion of the contract. An increase in the rent is possible but it has an upper limit (the consumer price index) | |
| Belgium | Statute of 1991 (comprehensive amendment in 1997) | Minimum duration of 3 years | An index-clause can be introduced to increase the rent (although increasing it above the applicable "cost of living" indices can be declared void by the courts). A market rent review can take place every three years (without the risk of being declared void by a court) | |
| Denmark | Rent Act (consolidated as Act 347 of 14/05/2001). Rent Control Act (consolidated as Act 348 of 14/05/2001) | No minimum duration is established by the legislation, although notice from the landlord to terminate the contract is subject to severe conditions. The landlord may give notice if he intends to use the apartment for himself. | Increase is allowed if justified (the value of the property must be significantly higher than the rent paid in proportion to that). An increase via an "index-clause" is generally not allowed. In small multi-storey properties, the rent is determined by the usual rent paid for properties of equal location, size, type, facilities and condition. | |
| England and Wales | Rent Act 1977. Housing Acts 1980, 1988, 1996 and the common law. | Several regimes are in force. From 1997 the "assured shorthold tenancy" is the default form of tenancy (the parties can contract for any duration they wish but the tenant has the right to remain in the property for an initial 6 months in any case) | There is no general public control of increases in rents although a specific rent increase may be submitted to control (courts, assessment committee). "Rent regulation" properly-speaking disappeared after the Housing Act of 1988. | Tenancies created before 15 January 1989 are governed by the Rent Act 1977. After that date (and before 28 February 1997), a tenancy can be an "assured tenancy" or an "assured shorthold tenancy" |
| Finland | Statute 482/1995. Statute 653/1987 (abrogated) | No restriction. Under previous statutes the grounds for eviction were strict. However a landlord's need to use the apartment for himself was a valid ground to evict the tenant. | No restriction. Usually the rent increase is linked to the consumer price index. | More general rent regulation existed before Statute 482/1995, such as a linkage to a public index. |
| France | Mermaz act, Law 89-462 (1989) | Minimum duration of 3 years (if the landlord is a natural person) | If the tenancy contract provides for the possibility of increasing the rent, the increase cannot exceed the construction cost index (determined by the public authorities). In the case of an extension of the lease, the new rent must refer to the average rent of the neighborhood. | Previous Acts introduced similar restrictions: Law 82-526 (Quillot Act), Law 86-1290 (Quilès-Méhaignerie) |

| | | | | |
|---|---|---|---|---|
| Germany | Civil Code (BGB). Amendments of 2001 and 2002 | The landlord has to give a reason listed in the BGB in order to terminate the contract. | If the rent exceeds by 20% the rent charged in comparable premises, the landlord can be fined. An increase in the rent can only take place after one year of tenancy. The increase can be agreed freely or linked to a cost-of-living index. If the increase is not agreed in the contract, the landlord can still ask for it but it cannot exceed the customary in the area where the premises are located (and in any case it cannot exceed a 20% increase over 3 years) | |
| Ireland | "Common law" system plus some Statutes (Residential Tenancies Bill 2003) | Tenant can ask for an extension of the lease (up to 4 years) after 6 months of tenancy. | No restrictions under the regime applicable before 2003. | |
| Italy | Law 392/1978. Reform introduced by Law 431/1998 | Minimum duration of 4 years | Before 1998, the rent and any rent increase were regulated. Since 1998, there is no regulation of this respect (rent increases can be freely determined by agreement of landlord and tenant) | |
| Portugal | Civil Code (1966). Decree-Law 321-B/1990. | Minimum duration of 5 years | The parties can choose between a "free rent regime" and a "conditioned rent regime". Free regime: the rent and its increase are freely agreed between the parties. Although in the case of a residential tenancy (in contracts of up to 8 years' duration) the increase is regulated (increase related to the consumer price index). Conditioned regime: the rent is set by the applicable law (which takes into account the average rents of similar premises). The conditioned regime may be mandatory under certain circumstances | A new Law (6/2006) has been passed. |
| Spain | Royal Decree-Law 2/1985. Law 29/1994 (Urban Tenancy Act) | Minimum duration of 5 years (Law 29/1994). | The rent increase is linked to the consumer price index | Under Royal Decree-Law 2/1985 (between 1985 and 1995) there was no compulsory extension of the contracts. Law 19/2009 gave the owner more legal grounds to reduce the duration of a tenancy contract |
| Sweden | Special Tenancy Act (1968), introduced in the Land Code (1970) | No minimum duration established by the Act. However, the Act establishes a strict regime for the landlord. For instance, the fact that the landlord needs the apartment for his own use is not a sufficient ground to terminate the contract | Prices are normally determined by the collective bargaining of associations. The courts do engage in some rent control | |

*Source: National laws, Government databases of laws and the EUI Tenancy Law Project.*

## 2.1 Spain

The tenancy market was not deeply regulated in Spain prior to 1931. Only some partial decrees limiting the duration of the tenancy contracts and rent therein were passed for specific situations and in particular cities during the 1920's.[4] The Spanish Civil Code (1889) was mainly liberal: Article 1255 thereof stated that private parties were free to agree any terms and conditions in a contract as long as they were not contrary to "*Law, morality and public order*".

In 1931[5] the limitations to contractual freedom introduced in the previous decade became permanent. However, the first complete piece of regulation of tenancy markets did not occur until 1946, with the "*Ley de Arrendamientos Urbanos*" (Urban Tenancy Act).[6] Since then, a Law of this kind has always remained in force in Spain (the aforementioned law of 1946 being the first, and later, the Laws of 1964, 1985 and 1994). The restrictions introduced by the 1946 Law were a reaction to the profound changes undergone in Spanish society before the Civil War, such as the rural exodus, and, after 1936, the shortage of housing caused by the Civil War. In any case, more general populist reasons also influenced these early initiatives which were a mean of winning support for the newly established political regimes (firstly, the Second Spanish Republic, and after 1939, Franco's dictatorship).

The Law of 1946 rendered the principles of the Civil Code almost inapplicable (Rodríguez-Aguilera and Peré, 1965), introducing, among other restrictions, a "compulsory duration clause" and a "regulation of rents". At this stage, the interventions were severe. The tenant's protection against eviction was unlimited. Even close relatives of the tenant were able to succeed him as tenants in the same dwelling and benefiting from the same conditions. With respect to rents, the Law established fixed one-time increments in the rent paid for apartments leased before 1939 and freezed the rents in respect of all new contracts.

In 1964 the Government adopted a new Law through a new Decree[7] which compiled several partial amendments to the old legislation (including the Law of 22 December 1955 among others). The new Law, which remained in force until 1985, maintained the rules governing the duration of the contract (indefinite extension thereof). However, a timid change in the rules governing the rents was introduced. The Law allowed an increase of the rents in contracts signed after 1956 after the fifth year of renewal of the contract. The increase was linked to an official index related to the "cost of living" published by the National Statistics Institute (INE).

The statistical information available on the tenancy market in Spain was very scarce, although following the census (1970 and 1981), the proportion of principal residences in the rental market diminished from 30.1% to 20.8%. As a consequence of

[4] Royal Decree of 21 June 1920. Its effects were extended by subsequent Royal Decrees in 1921, 1922, 1923, 1924 and 1925.

[5] Decree of 29 December 1931.

[6] Law of 31 December 1946.

[7] Decree 4104/1964 of 24 December 1964.

this weak proportion, the Government decided in 1985 to liberalize the tenancy market by removing the requirement of compulsory extension for all tenancy contracts concluded after that year ("*Decreto Boyer")*.[8] However, the rents were still linked to the Consumer Price Index (CPI) and the Decree was not applicable to all of the contracts signed before 9 May 1985.

The censuses suggest that the effects of the new rules were quite limited: the census of 1991 showed a further reduction in the weight of the tenancy market (15.2%) although the pace of reduction had also slowed compared to previous decades.[9]

In 1994, the Parliament enacted the most recent Law.[10] On the one hand, it aimed to reduce the instability caused by the very short duration of the contracts regulated by the "*Decreto Boyer*". On the other, it aimed to address the problem of the coexistence of very different types of contracts (the "new" contracts concluded after 1985 and the "old" contracts which were rigidly regulated). Thus, the Law reintroduced compulsory durations for a limited period of 5 years and maintained a rent control that tied rental increments to the CPI. However, it removed the principle of the unlimited extension of contracts signed before the reform of 1985 (such contracts could therefore no longer be transferred to other members of the family, leading to their extinction in the medium term).

Thus, following the classification made by Arnott, rent control in Spain partially transformed into a "second generation" type during the 1960's. However, modernization of the regime of compulsory extension of tenancy contracts did not occur until 1985.

The most recent legal developments in Spain do not include the approval of a new tenancy law (so the Law of 1994 is still into force). However, the reform of that Law in November 2009[11] is worth noting: it introduced a significant change by giving the owner more legal grounds to terminate a tenancy contract. Specifically, a landlord may now terminate the tenancy contract if they require the dwelling for the use of his child(ren), parent(s) or a spouse in the case of divorce, provided that these circumstances are noted on the contract. Before 2009, the owner could only terminate the contract in the event that he needed to occupy the house for his own use.

In light of the statistical information available, a stable proportion of rental housing has been maintained over the last decade. The weight of the rental market was 11.4% in 2001 and remained at around that proportion until 2008 when, as estimated by the Ministry of Housing, it rose to 13.2%. Unfortunately there is still no information available allowing an assessment of the effects of the reform of 2009 in this regard.

[8] Royal Decree 2/1985 of 30 April 1985.

[9] As the Preamble to the Law 29/1994 states: "El Real Decreto-Ley 2/1985 ha tenido resultados mixtos (…) Ha permitido que la tendencia a la disminución en el porcentaje de viviendas alquiladas que se estaba produciendo a principios de la década de los ochenta se detuviera, aunque no ha podido revertir sustancialmente el signo de la tendencia (…)".

[10] Law 29/1994 of 24 November 1994.

[11] Law 19/2009 of 3 November 2009.

## 2.2 Italy

Similarly to Spain, the rules established in Italian Civil Code were liberal. For instance, Article 1322 of the Civil Code (1942) established that the content of the contracts was a matter for the parties (although it must respect the Law). However, several special regulations introduced since the 1920's were already limiting the rents and setting out certain requirements for the terms of the contracts (Breccia and Bargelli, 2005).

The first complete Law on tenancy contracts (1978)[12] introduced a quite severe rent control system, as the rent was determined by a set of criteria such as the population of the municipality, the age of the building, floor number, cadastral type, state of repair or preservation. The Law also established a compulsory (extendable) duration of 4 years. Moreover, other compulsory durations of 6 to 9 years were applicable depending on the activity to be carried out in the dwelling.

In 1992,[13] a new Law deregulated rents in respect of contracts to come into existence and introduced some rules to deregulate existing contracts. No changes were made in respect of the compulsory duration of contracts. The Law of 1992 can be considered as the introduction of second generation rent control in Italy.

These steps towards liberalization were confirmed in 1998 with the enactment of the most recent tenancy Law,[14] which established that the parties could freely negotiate the rent as well as any increase of the rent in future . It should be noted, however, that some special limitations on the increase in the rent subsisted (a maximum of 75% of a "cost of living" indicator). On the other hand, the Law maintained in force rules related to the duration of the contract by establishing a protected term of four years.

The reform of the Italian regulations to achieve a more liberal framework for tenancy contracts were influenced by the idea that the market was not functioning properly. 36% of the dwelling stock was rented in 1980 but just 22.5% in 1991 (see Figure 1). Recent data from 2004 (18,6%) shows that the decreasing pattern continued, although at a much slower pace.

## 2.3 Finland

As in the previous cases, the legal philosophy underpinning the tenancy contracts was a liberal one (Ralli, 2005). However, after the First World War, Finland experienced periods of both regulation and deregulation. Rent control was introduced for the first time during the First World War, but was lifted by the first Law on Tenancies of 1925.[15] Following the same pattern, the second period of rent control took place during the Second World War but, in this case, the restrictions were maintained after the end of the conflict (up until 1960 in several cities).

[12] Law 392/1978 ("sull'equo canone") of 27 July.

[13] Decree-Law of 11 July 1992 (converted into Law 359/1992 of 8 August 1992).

[14] Law 431/1998 of 9 December 1998.

[15] Law 166/1925 of 12 May 1925.

A deeper rent regulation froze the rents of the tenancy contracts in 1968 (thus, an example of first generation rent control) and, in 1969, tenants were also given protection against eviction on an unlimited basis. These restrictions were also set forth in the Constitution in 1970. The regulations affecting the tenancy market in Finland were only relaxed in the following decade (the rent freeze was substituted by a complex system of rent regulation in the Law 634/1987).

Heavy regulation was accompanied by a contraction of the tenancy market from 32.5% (1970) to 24.7% (1990) (see Figure 1).

During the 1990's the market was gradually liberalized in three phases: from 1991, some buildings in specific zones of Finland were freed from rent control. The measure was then extended to all future contracts in 1992. Finally, the new tenancy Law of 1995[16] deregulated all contracts (with the exception of the ARAVA program applicable to state-subsidized rental dwellings). On the other hand, the new Law did not include any restrictions with respect to the duration of the contract so any short-term agreement was possible. As a consequence, one can conclude that Finland is the only country of the European Union to have totally liberalized a previously regulated tenancy market.

The share of the housing market that was rented increased to 31% in 2004. Lyytikäinen (2006) identifies the abolition of the rent control with a corresponding increase in the rent paid (the average rent per square meter increased by 57% between 1990 and 2004).

## 2.4 United Kingdom

England and Wales do not have a specific body of "housing law". Thus, the norms applicable to tenancy contracts stem from more general branches of law such as property law and contract law (Cowan and Laurie, 2005). However, some restrictions applicable to the tenancy market were introduced through the adoption of some special regulations (statutes).

The first example of rent control and protection against eviction occurred during the First World War with the "Increase in Rent and Mortgage Interest Act" of 1915.[17] Several subsequent Acts[18] preserved or even extended the rent control measures (Diamond, 1960). As a matter of fact, rent control did not disappear until 1965 when it was replaced by rent regulation (representing a "second generation" control).

According to Paish (1972), these long-lasting restrictions had a negative effect on the maintenance of the dwellings and reduced the mobility of tenants who occupied a rent-controlled dwelling (as they found it unprofitable to move). Moreover, these restrictions reduced the number of units being let, as a significant amount of the previously rented dwellings were gradually channeled towards the property market. Similar effects of tenancy regulations have been found in the case of many other countries or cities (Olsen, 1972, Early, 1999, Sims, 2007).

[16] Law 481/1995 of 31 March 1995.

[17] Increase of Rent and Mortgage Interest (War Restrictions) Act, 1915.

[18] Increase of Rent and Mortgage Interest (Restrictions) Act, 1920. Rent and Mortgage Restrictions Act, 1923. Furnished Houses (Rent Control) Act, 1946. Landlord and Tenant (Rent Control) Act 1949.

Later on, the Rent Act of 1977 established a "protected tenancy" which included a second generation rent control, although any increase in the rent was regulated by complex provisions and the legislation also maintained a permanent protection against eviction for the tenant.

The first steps towards liberalization of the market took place with the Housing Act of 1988, which abolished the rent regulation. In respect of compulsory duration clauses, the Act introduced a new type of regulated contract, the "assured shorthold tenancy" with a period of protection against eviction of only 6 months. However, it also included an "assured tenancy" contract, containing similar conditions to the old "protected tenancy". Finally, a new Housing Act of 1996 introduced further changes in favor of the generalization of the "assured shorthold tenancy".

Consequently, England and Wales have undergone an evolution from a liberal concept of tenancy contracts to a strict system of contract restrictions, finally returning again to a quite liberal concept of tenancy contract in which the main restriction is the "compulsory" duration of 6 months, which is quite short by European standards (see Table 1).

The figures of the tenancy market in England and Wales also show quite important changes. In 1900, just 10% of households were owner-occupied, while in 2000 that proportion reached 70% (Cowan and Laurie, 2005). In 2004, the share of rented dwellings in the UK was 31% (see Figure 1). We can observe a slow reduction in the proportion of rented dwellings over recent decades although this proportion remained stable in later years.

## 2.5 Recent reforms

These cases suggest the existence of a general pattern in the evolution of tenancy market regulation in Europe throughout the 20$^{th}$ century: initially all countries moved from a liberal concept of tenancy relations towards a more protective and regulated approach. That change was influenced by the experience of the two World Wars. The introduction of very restrictive regulations coincides with significant reductions in the share of rented dwellings. Later on, all countries tended to reduce the burden imposed on the landlord and tried to limit the scope of the protection afforded to the tenant's although no country (with the exception of Finland) completely liberalized the tenancy market. Deregulation was accompanied by an increase in rented dwellings in Finland and stabilization in the other countries examined. Those effects can be taken as partial evidence, admittedly very weak, that the restrictive European regulations may have brought out some negative effects in the European markets. As previously stated, there are several other important factors affecting the tenancy market that are not taken into account in this partial-equilibrium argument (*i.e.* improved access to credit, taxation, changing mobility patterns, etc).

Table 1 shows two key features of the current European regulations in 12 EU Member States (Austria, Belgium, Denmark, England/Wales, Finland, France, Germany, Ireland, Italy, Portugal, Spain and Sweden): the minimum duration of the

tenancy contract (if such regulation exists, see column DURATION) and the rules governing any increase in the rent paid by the tenant (see column RENT).

Across Europe, direct regulation of the amount of rent that a landlord may charge at the moment of entering into a contract has completely disappeared. On the other hand, the negotiation of any increase in the rent paid by the sitting tenant after the first year of contract is not free, but regulated in several countries in accordance with a "second generation" type of control (for instance, linking any increase in the rent to an index identified by the legislation). In Austria, Portugal and Spain, it is index-linked to the Consumer Price Index (CPI). Similarly, in Belgium, the maximum increase is in accordance with the "cost of living" index. In France, the maximum increase is given by the "construction cost index" (set by the Government).

In relation to the second issue, the legislation usually protects a tenant against eviction for a certain period (see column "DURATION") by setting a "compulsory duration". For instance, the duration of a tenancy contract in Spain is 5 years (4 years in Italy and 3 years in France). Thus, the tenant may decide not to move for five years or to move after the first one, but the landlord cannot reduce the "potential" duration of the contract. It is after those five protected years that a real re-negotiation between the landlord and the tenant could take place. It is rare to find this type of limited restriction in other jurisdictions, like the ones in force in several cities of the United States.

## 3. A model for European tenancy markets

The objective of this section is to explore theoretically the effects of the European-type of tenancy market regulations on the quantity of houses being let in the market. For this purpose, the model proposed by Basu and Emerson (2000) is modified and adapted to the "European" institutional framework. Understanding the impact of restrictive regulations (such the ones explained above) may help to understand one of the possible determinants of the reduction of the share of tenancy in Europe.

### 3.1 The Basu and Emerson model for tenancy markets and the European institutions

In their original model, Basu and Emerson (2000) study a very restrictive "first generation" type of rent control. In their setup, once the contract is entered into (and a rent agreed), the landlord cannot update the rent until the end of the contract and, as the legislation protects the tenant against eviction indefinitely, the tenant decides how long he wishes to remain in the dwelling. In this context, due to the eroding effect of inflation, it is of extreme relevance for the landlord to know the kind of tenants he takes (type understood as "long-stayer" or "short-stayer" tenant because, with inflation, the rent in real terms will diminish periodically). Thus, inflation acts as a tax on a landlord's income with redistributive consequences, adverse to owners and favorable to tenants. These stylized institutions differ quite considerably to what is currently regulated by law in Europe (see Table 1).

European policymakers are aware of the existence of inflation as an "ever" increasing "cost of living" in the economy, as was emphasized in section 2. Legislation in various European countries therefore allows the landlord to increase the contracted rent, at the end of each contractual period, in accordance with a rate linked to some

indicator of past inflation (such as the CPI, thus following a "second generation" control). Note, however, that those measures are usually related to the price increase in the whole economy (and not specifically to increased rents in the tenancy market). Another difference with the Basu and Emerson (2000) framework is that the protection against eviction in favor of the tenant does not last indefinitely (being usually applicable for just 3 to 5 years).

### 3.2 Basics of the model

Basu and Emerson (2000) propose a partial equilibrium model for the tenancy market in which the market is affected by a problem of information asymmetry and adverse selection. There are two types of agents in the model: landlords and tenants.

Tenants are distributed in groups or types that differ in how long they stay in the residence. It can be assumed that a type 1 tenant stays 1 year in the residence. A type 2 stays 2 years and so on. A fraction $i$ of the tenants is of type $i$ (all types together sum up to a probability, $p$, of 1). If $t$ represents time, the following could be written:

$$t_1 < t_2 < t_3 < ... < t_n \tag{1}$$

Therefore, the duration of the contract will be defined by the tenant's type as it is the tenant who decides when to move. Moreover, the tenant knows his "type", but the landlord does not have access to that information. The landlord is consequently unable to distinguish between the various tenants types.

The model assumes that there is inflation ($\theta$) in the economy and that it is not corrected by any mechanism (this rate of inflation, $\theta$, is understood as the rise in prices in all goods and services of the economy, tenancy rents included). Therefore the landlord receives the real value $\frac{1}{1+\theta}$ after one period (or the fraction $\frac{1}{1+\theta}$ of the rent if the rent is different from 1). Moreover, landlords do not value equally a rent received today compared to a rent to be received in the future. Therefore a discount factor $\delta \in (0, 1)$ has been introduced in the model.

$v_i$ is the value of the rents that a landlord receives from his tenants if only type $i$ tenants are present. Summing up for an infinite succession of type $i$ tenants and taking into account the discount factor, we have (if the rent $R=1$):

$$v_i = 1 + \frac{\delta}{1+\theta} + \left(\frac{\delta}{1+\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\theta}\right)^{t_i - 1} + \delta^{t_i} v_i \tag{2}$$

Then, the following holds:

$$\text{If } i < j \text{ then } v_i > v_j \tag{3}$$

On the other hand, $v_{(i)}$ is the value of the rents that a landlord receives when only types $i$ or above are present.

$$v_{(i)} = \sum_{k=i}^{n} \left( \frac{p_k}{\sum_{j=i}^{n} p_j} \right) \left[ 1 + \frac{\delta}{1+\theta} + \left( \frac{\delta}{1+\theta} \right)^2 + (...) + \left( \frac{\delta}{1+\theta} \right)^{t_k - 1} + \delta^{t_k} v_{(i)} \right] \tag{4}$$

Where $p_k$ is the probability of getting a type $k$ tenant into the apartment. Then, the following holds,

$$\text{If } i < j \text{ then } v_{(i)} > v_{(j)} \tag{5}$$

It may be observed that, from the point of view of a landlord, the higher the value of $v$ the better. Therefore he would prefer to have short stayers rather than long stayers.

Basu and Emerson (2000) introduced adverse selection through limiting the types of tenants that will be finally renting a residence. If the rent is very high some types of tenants will find it unaffordable to rent and therefore will opt for other options, such as remaining in the family home. This outside option is assumed to be the same for the different types of tenants and it is assumed to have a similar value in any case. Therefore, the different outputs of the model are generated by heterogeneity on the tenants' side (long versus short stayers).

The adverse selection mechanism is based on the supposition that the short stayers are the first to decide not to rent when the rent is high. Supposing that renting a residence gives the tenant a utility of $T$ and remaining in the parents' home (or equivalent options) a utility $NT$, the difference ($D$) between both utilities must be positive for an individual to decide to rent an apartment.

$$T - NT = D > 0 \tag{6}$$

For a tenant it is relevant the rent expressed in present value terms ($v_i$), thus already "eroded" by the inflation. Therefore a tenant will rent if:

$$T - NT = D \geq Rv_i \tag{7}$$

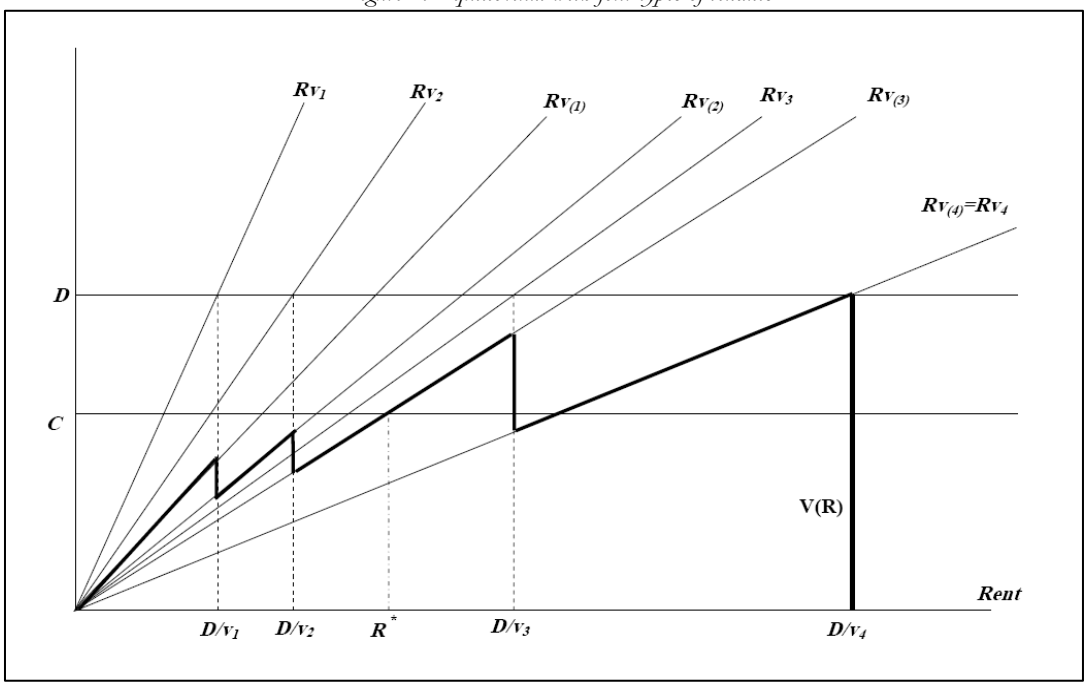
Note that $v_i$ depends on $i$, so if $j > i$ then $v_i > v_j$. It is worth noting that equation 7 is assuming that a specific tenant is defined for eternity as a type $i$.

On the other hand, Basu and Emerson (2000) call $V(R)$ the landlord's expected present value of the rents he receives when the rent (in nominal terms) is $R$. See Figure 2.

$V(R)$ reaches its maximum when $R = D/v_n$ (8)

$D/v_n$ is a critical level of the rent at which the higher type of tenant (so far the type $n$ or the type 4 in Figure 2) decides not to rent. $C$ (see Figure 2) represents the cost for the landlord of leasing out a residence, for instance, preparing the apartment to be rented paying some administrative fees. Note that the costs may be proportionally higher the shorter the periods the tenants stay in the apartment, although that circumstance is not included in this setup.

*Figure 2: Equilibrium with four types of tenants*




*Source: Self elaboration.*

We have the following critical values of $V(R)$ as a result,

$$\left\{\begin{array}{lll} V(R) = v_{(1)} & \text{if} & R \le D/v_1 \\ V(R) = v_{(2)} & \text{if} & D/v_1 < R \le D/v_2 \\ V(R) = v_{(3)} & \text{if} & D/v_2 < R \le D/v_3 \\ V(R) = v_{(4)} & \text{if} & D/v_3 < R \le D/v_4 \\ V(R) = 0 & \text{if} & D/v_4 < R \end{array}\right\}$$

The results obtained in this basic setup are the following: on the one hand, if there is a monopolistic landlord, he will charge a rent $R=D/v_n$ . Note that in Figure 2 the curves $v_{(i)}$ define the height of the *V(R)* curve at the breaking points. Thus, only the higher type *(n)* will stay in the market, that is, a four year type in Figure 2 (all the rest of the tenant types will find unaffordable to rent and will opt for other options). On the other hand, when there are competitive landlords, the rent *R** will be defined by *C=V(R)*. One can observe that the height of the peaks plays an important role in this case. Consequently, the rent paid in the market will approach the cost of preparing the residence to be rented. The rent *R* obtained in that case will define which types (if any) of tenants will decide not to rent. The lower the *C* the lower the equilibrium rent and therefore the less types of tenants that will be "excluded" from the market.

### 3.3 The basic model with inflation (CPI) adjusted rents

With inflation escalation (correcting for $\theta$ in the model) and with *R=1* euro the expressions for $v_i$ and $v_{(i)}$ simplify, so we obtain the following equations:

$$v_i = v_{(i)} = \frac{1}{(1-\delta)} \tag{9}$$

Equation 9 does not depend on any sub-index, therefore the tenant is irrelevant for the landlord when rent escalation following the inflation is allowed. Thus, it is not possible to differentiate between those that find it worthwhile to rent and those who prefer to stay out of the tenancy market.

As $Rv_i \le T - NT$ and $v_i$ does not depend any more on the type, then we have,

$$\frac{R}{(1-\delta)} \le T - NT \tag{10}$$

Therefore the type of the tenant is not important in the decision to rent.

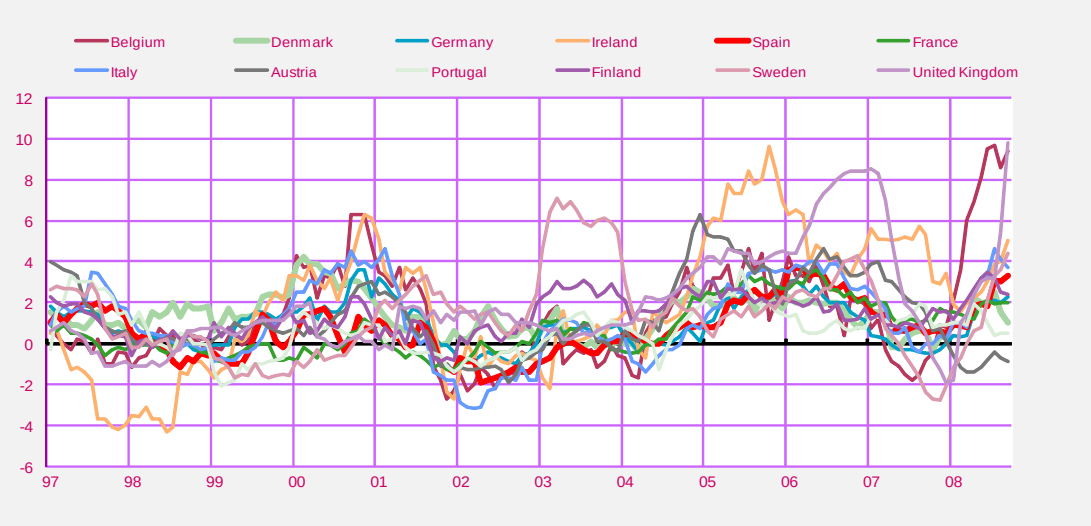
Two criticisms may be done to the considerations made above. On the one hand it should be said that concluding that the introduction of rent escalation removes the mechanism of adverse selection is not true in all the cases. Only if the CPI coincides with the observed increase in the rents contracted in the market (the sub-index of rented

property of the CPI), the correction by $\theta$ would eliminate the adverse selection mechanism. The next section is devoted to discuss that topic. On the other hand, even after the correction by $\theta$ the tenant has still a contractual advantage with respect to the landlord. The law is always granting to the tenant an option of changing landlords if he wants to do so (but the landlord cannot evict freely its tenants).

### 3.4 European rent escalation and adverse selection

Overcoming the adverse selection problem is only possible if the allowed rent escalation follows the increase in the rents observed in the tenancy market (the sub-index of rented property in the CPI or a similar index representing just the tenancy market) and not a general price index (as is frequently the case in Europe). Generally both indices do not coincide. Figure 3 graphs the difference between the HICP inflation (harmonized inflation) in housing (rents plus gas, water and electricity as provided by the Eurostat indicators) and the general or overall inflation. As it can be seen, that difference is usually above 0. The figure indicates that renting is usually more inflationary than the overall HICP.

*Figure 3: Housing component of the harmonized inflation indices (HICP) minus general HICP in 12 EU countries*




*Source: Eurostat (2008).*

The incentive for a landlord to prefer short stayers versus long stayers is related to the fact that the rent he gets is eroded (once a contract is concluded), compared to that demanded in future contracts on the market. If the landlord has short stayers he will be able to reset the rent he demands as soon as he has a new tenant and therefore he would be able to charge the rent at the market level, fully up-to-date with inflation and increases in rent on the market since the conclusion of the previous contract. If the applicable legislation permits a full periodic updating of the rent, specifically following

any observed rent increase in the tenancy market, the incentive for the landlord to have short stay tenants disappears.

These statements can be explored in the model. For convenience, the rate at which the rents increase in the market can be stated as $\gamma$. And, as before, let's call $\theta$ the rate at which the regulation allows the landlord to periodically update the rent. $\theta$ may be understood as the CPI index (or a "cost of living" index) in the European regulations.

It can be demonstrated that in a market where the applicable laws allow escalation of the rent following $\theta$ and $\theta < \gamma$, then there is a problem of adverse selection in the tenancy market.

Taking into account a discount factor $\delta$ as before (and if $R=1$), we can now construct the expressions we need to set up the model.

$$v_i = 1 + \frac{\delta}{1+\gamma-\theta} + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i-1} + \delta^{t_i} v_i \tag{11}$$

That is,

$$v_i = \frac{1-\left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i}}{1-\left(\frac{\delta}{1+\gamma-\theta}\right)(1-\delta^{t_i})} \tag{12}$$

Then, the following holds (a proof is provided in the appendix 1)

$$\text{If } i < j \text{ then } v_i > v_j \tag{13}$$

As before, $v_{(i)}$ represents the stream of income a landlord receives when type $i$ tenants or above make themselves available to the landlord.

$$v_{(i)} = \sum_{k=i}^{n} \left(\frac{p_k}{\sum_{j=i}^{n} p_j}\right) \left[1 + \left(\frac{\delta}{1+\gamma-\theta}\right) + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_k-1} + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_k} v_{(i)}\right] \tag{14}$$

That can be rewritten as follows,

$$v_{(i)} = \frac{\sum_{k=i}^{n} p_k (1-\delta^{t_k}) v_k}{\sum_{j=i}^{n} p_j - \sum_{k=i}^{n} p_k \delta^{t_k}} \tag{15}$$

Then the following also holds (a proof is provided in the appendix 2):

$$\text{If } i < j \text{ then } v_{(i)} > v_{(j)} \tag{16}$$

As may be concluded from the equations set out so far, the landlord prefers short stayers than long stayers as the income he receives will be higher in the case of the former. Also the agents are not indifferent with respect to time. A long stayer pays less per period (in real terms) than a short stayer. The decision to rent is affected by that fact.

As before:

$$T - NT = D > Rv_i \tag{17}$$

As previously stated, if $i < j$ then $v_i > v_j$. Thus, short stayers will be the first types of tenants to decide not to rent because they "suffer" a higher value $v$. The landlord's expected present value of the rent will reach its maximum level when $R = D/v_n$. That is, $D = Rv_n$.

Thus, if the rent escalation allowed is below the rate of the rent increase in the tenancy market (described as the "rent index"), the adverse selection problem continues to affect the market outcomes.

Therefore, even though the various national legislations in Europe allow for rent escalation following the general inflation or a similar index, they does not avoid the adverse selection problem to affect the market outcomes when the rent signed in the new contracts grows faster than the prices in the rest of the goods of the economy.

### 3.4.1 Between extreme cases

The inefficiency in the market will be higher if the difference between the CPI (or another general inflation index) and the specific rent index grows. This statement can be expressed in the following way (for a given rate of rent increase of $\gamma$).

$$\text{If } \theta < \theta' \text{ then } v_{i(\gamma,\theta)} < v_{i(\gamma,\theta')} \text{ and } v_{(i)(\gamma,\theta)} < v_{(i)(\gamma,\theta')} \tag{18}$$

That is, an increase in $\theta$ (if $\gamma$ is constant) entails an increase in the real rent the tenant will pay.

From the fundamental equations already proposed it is possible to derive the following expression (when $R = 1$).

$$(1-\delta^{t_i})v_i = 1 + \frac{\delta}{1+\gamma-\theta} + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i-1} \tag{19}$$

By inspection of equation 19 it is easy to see that the higher the $\theta$, the higher is the value of $v_i$ (if $\gamma$ is constant).

Also,

$$v_{(i)(\gamma,\theta)} = \frac{\sum_{k=i}^{n} p_k (1-\delta^{t_k}) v_{k(\gamma,\theta)}}{\sum_{j=i}^{n} p_j - \sum_{k=i}^{n} p_k \delta^{t_k}} \tag{20}$$

Then the higher the $\theta$, the higher the value of $v_{(i)}$.

Graphically, when observing the shape of the $V(R)$ curve it is important to stress that the curves representing $v_{(i)}$ and $v_i$ are steeper the higher is $\gamma$-$\theta$ (the lower the escalation allowed by the applicable law the flatter those lines). The height of a peak is defined by $(D)v_{(i)}/v_i$. Therefore it is necessary to analyze the value of $v_{(i)}/v_i$ when the allowed escalation changes.

Having that $k > i$ (the tenant of type $k$ stays longer that a tenant of type $i$) the following must hold when $\theta < \theta'$,

$$\frac{v_{k(\gamma,\theta)}}{v_{i(\gamma,\theta)}} < \frac{v_{k(\gamma,\theta')}}{v_{i(\gamma,\theta')}} \tag{21}$$

Lets define $\tau$ as the extra time a type $k$ stays in the dwelling in comparison with a type $i$. Then, from the general derivation obtained in 12, the following holds,

$$\frac{v_{k(\gamma,\theta)}}{v_{i(\gamma,\theta)}} = \frac{1-\delta^{t_i}}{1-\delta^{t_i+\tau}} \cdot \frac{1-\left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i+\tau}}{1-\left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i}} \tag{22}$$

And having that,

$$\frac{\partial\left(\frac{v_{k(\gamma,\theta)}}{v_{i(\gamma,\theta)}}\right)}{\partial\theta} > 0 \tag{23}$$

It is obtained that an increase in $\theta$ yields an increase in $\frac{v_{k(\gamma,\theta)}}{v_{i(\gamma,\theta)}}$.

From 21, the following must hold (for $\theta < \theta'$).

$$\frac{v_{(i)(\gamma,\theta)}}{v_{i(\gamma,\theta)}} < \frac{v_{(i)(\gamma,\theta')}}{v_{i(\gamma,\theta')}} \tag{24}$$

Inequality 24 indicates that the higher the rent escalation $\theta$ allowed by the applicable legislation Law, the higher the "peak" (at the break points).

If there are several landlords competing to obtain the tenants, and a cost $C$ of preparing a residence to be rented, the equilibrium rent is defined graphically by the point of hit between $C$ and the $V(R)$ curve. If we observe that the escalation allowed is lower, the equilibrium rent must increase as, graphically, the $V(R)$ line moves to the right and the peaks are now shorter.

A higher rent excludes more types of potential tenants from the market. As $\theta$ grows, the peaks of the $V(R)$ line get higher and the break points move to the left, with the result of a smaller $R$ (so less types are excluded; that is a relief for the adverse selection problem).

On the other hand, in a monopolistic case, the rent will be set up at $D/v_n$. Hence the equilibrium rent will change slightly depending on the value of $v_n$ (as $v_{n(\gamma,\theta)} < v_{n(\gamma,\theta')}$). So when the escalation allowed is higher, the equilibrium rent for the case of monopoly is lower.

The statements made above indicate that allowing for a higher rate of escalation mitigates the inefficiency of the market.

### 3.4.2 If there is a reduction in the market rents

If $\gamma$ is exactly equal to the amount that the government allows for escalation (the "cost of living" or the CPI) no adverse selection will take place.

What happens to the previously existing tenancy relations in a market where the rents agreed in future contracts are diminishing over time? In that case the rents of the market (the rents agreed in the contracts coming into existence signed one period after

another) would be falling. Thus, the new tenants (tenants that have just arrived on the market) would be paying less than the previously existing tenants renting similar flats. As a consequence, the only way for the landlord to keep his existing tenant is to reduce the rent he asks at a rate (falling) near to that of the market.

Therefore, it is worth noting that even in this case the positions of tenants and landlords are unequal. That is, in this case the applicable law leaves the tenant the option to move and thus change landlords if the rents rise below the general inflation.

However, in this case there is no issue of adverse selection and therefore the legislation as usually adopted in Europe does not entail the inefficiencies observed where there is a persistent reduction of market rents.

## 3.5 Analysis of contracts with a limited duration of protection for the tenant

As discussed above, the applicable national laws in Europe do not generally protect a sitting tenant indefinitely. In fact, such laws usually protect a tenant against eviction for a limited period (usually 3 to 5 years). After that period has expired, the tenant and the landlord will have to renegotiate the contract. Thus, the continuation of the tenancy relationship is not guaranteed. Therefore the contract between the parties is virtually new again after the relationship has reached the limit of the period of protection.

The aim of this section is to introduce this limited protection afforded by law to the tenant into the model. A relevant issue for the landlord in the model is that he cannot distinguish between tenants' types. In the case of a law that protects the tenants for $m$ periods, the landlord knows that the "higher" type of tenant that exists in the economy is a type $t_m$. That is to say that a landlord is not willing to keep a tenant more than $m$ periods as for any $n > m$, $v_m > v_n$ and $v_{(m)} > v_{(n)}$. Therefore, in this context of asymmetric information, if the applicable law protects the tenant for $m$ periods, the higher types disappear (after $m$ periods the landlord will evict the tenant if he does not pay the actual market rent).

If, before introducing the restriction the higher type of tenant in the economy was a type $k$ and afterwards a new law (including a protection term of $m$ periods) is adopted and if $k < m$, that "limited duration of protection" is neutral and does not produce any effect in the economy. Thus, in the next paragraphs we assume that the higher type of tenant $(k)$ existing in the market is willing to stay longer in the residence than the period for which he is protected ($m$ periods established by the applicable law).That is, we study the case in which the law act as a constraint.

**Introducing the term in the model.** The analysis should cover how the expressions for $v_i$ and $v_{(i)}$ change if the limited duration of tenancy protection is present and thus if there is a new equilibrium in the market.

$v_i$ does not change if we change the different types of tenants that exist in the economy. Although note that a value $v$ exists only for the types $i \leq m$. On the other hand, $v_{(i)}$ changes. Now, the tenants that may "show up" correspond to a less number of types. Let's call $v_{(i,m)}$ to the value for the expression $v_{(i)}$ when just types $i$ to $m$ can show up. Then the following condition holds:

$$v_{(i,m+1)} < v_{(i,m)} \tag{25}$$

To prove 25, we know that,

$$v_{(i,m+1)} - v_{(i,m)} = \frac{\sum_{k=i}^{m+1} p_k(1-\delta^k)v_k}{\sum_{j=i}^{m+1} p_j(1-\delta^j)} - \frac{\sum_{k=i}^{m} p_k(1-\delta^k)v_k}{\sum_{j=i}^{m} p_j(1-\delta^j)} \tag{26}$$

Then, equation 26 can be expressed as follows,

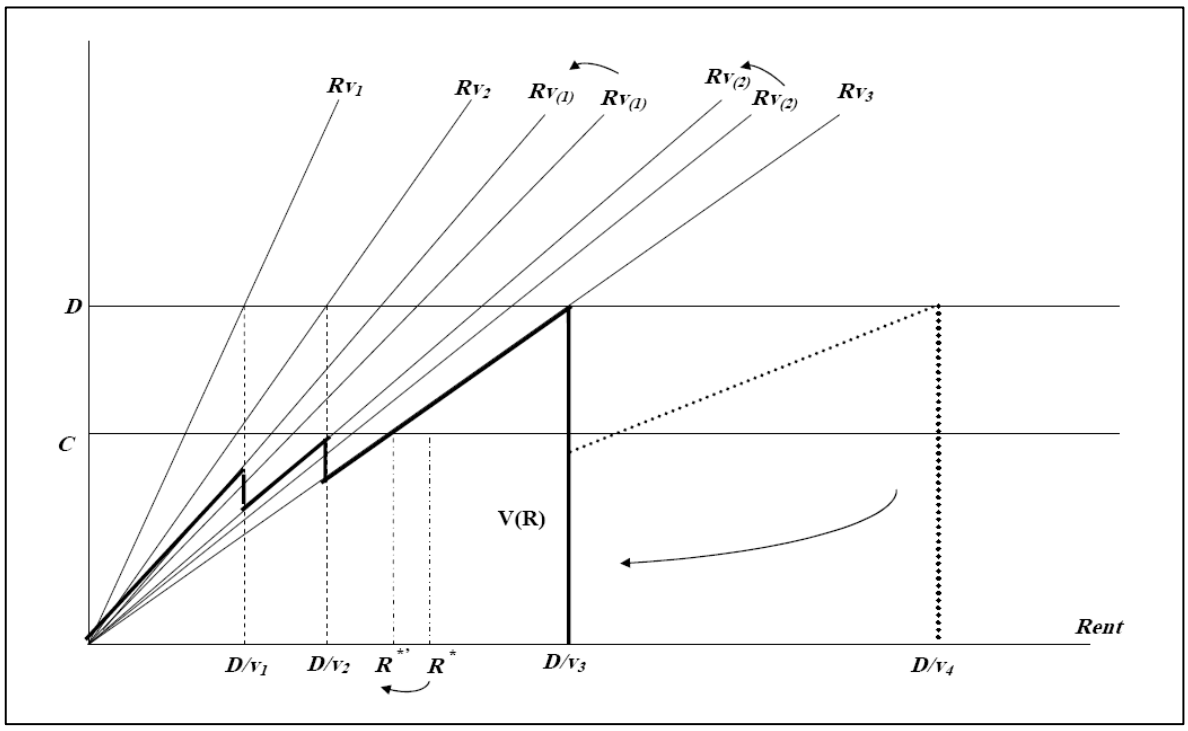
$$v_{(i,m+1)} - v_{(i,m)} = \frac{\sum_{k=i}^{m} p_k(1-\delta^k)v_k\left(\frac{\sum_{k=i}^{m} p_k(1-\delta^k)}{\sum_{j=i}^{m} p_j(1-\delta^j)} - \frac{\sum_{k=i}^{m+1} p_k(1-\delta^k)}{\sum_{j=i}^{m} p_j(1-\delta^j)}\right) + p_{m+1}(1-\delta^{m+1})v_{m+1}}{\sum_{j=i}^{m+1} p_j(1-\delta^j)} \tag{27}$$

That is below zero:

$$v_{(i,m+1)} - v_{(i,m)} = \frac{P_{m+1}(1-\delta^k)\left(v_{m+1} - \frac{\sum_{k=i}^{m} p_k(1-\delta^k)}{\sum_{j=i}^{m} p_j(1-\delta^j)} v_k\right)}{\sum_{j=i}^{m+1} p_j(1-\delta^j)} < 0 \tag{28}$$

When the law protects the tenant against eviction for a greater period of time, the value of $v_{(i)}$ diminishes (that is $v_{(i,m+1)} < v_{(i,m)}$). If a law reduces the number of periods of protection against eviction from $m+1$ to $m$ we should expect an increase of the value of $v_{(i)}$. In Figure 4 a situation where the Law reduces the maximum term of protection from $m=4$ to $m=3$ has been represented.

*Figure 4: Effects of a reduction in the duration of protection*




*Source: Self elaboration.*

**Case of having a monopolistic landlord.** Reducing the number of periods of protection yields a reduction in the rent charged by the monopolist, therefore less (lower) types of tenants are excluded from the market.

As previously discussed, the monopoly charges a rent equal to $R=D/v_t$. Where $t$ represents the higher type existing in the economy. If the number of periods of protection against eviction is reduced, $t$ will be lower. With a lower $t$ the value $v_t$ is higher. With a higher $v_t$ the rent $R$ charged by the monopolist will be lower if the outside option does not change.

**Case of having competitive landlords.** When the number of periods of protection is reduced, the equilibrium rent also decreases. That could exclude, therefore, less (lower) types of tenants from the market. That is, the landlords will charge a rent determined by the cost $C$ of allowing the dwelling to be rented on the market. Graphically, as the curves defined by $v_i$ continue to be in the same place but the curves defined by $v_{(i)}$ are now steeper, there is now a new $V(R)$ line. This $V(R)$ line maintains the places where the "breaks" (peaks) ($D/v_1$, $D/v_2$...) can be found, but the height of the peaks are now higher. The coincidence between the $V(R)$ line and the $C$ line will yield an equilibrium rent that is lower than before.

## 3.6 Summarizing the results of the model

The aim of the model was to analyze the effects on the market of the introduction of two highly spread (and typically European) institutions: a maximum allowed increase

in the rent demanded by the landlord (rent control) and protection against eviction for the tenant for a limited number of periods (protection against eviction).

If the rent escalation allowed is below the rate of rent increase in the tenancy market, an adverse selection problem affects the market outcomes. The adverse selection problem is aggravated as the difference between the allowed escalation and the market rent increase grows. That will increase the equilibrium rent and, through the mechanism of the model, it will exclude some tenants from the market. On the other hand, it was concluded that the longer the period for which the law protects the tenant against eviction, the higher the rent paid in equilibrium (therefore more tenant types are excluded from the market). Note that the effects of both restrictions go in the same direction.

## 4. Conclusions

This paper provides an economic analysis of the regulations affecting European tenancy contracts. Although rent control has drawn the attention of the greater part of the literature on tenancy markets, an analysis of the regulations in place in Europe points to the existence of another main intervention in the market called "protection against eviction" or "compulsory duration" that has been usually neglected. Both types of European regulations (rent control and periods of protection against eviction) are explored theoretically in an information asymmetry model of tenancy markets proposed by Basu and Emerson (2000). The model, which was originally designed for analyzing contracts with no inflation clause and of potentially infinite duration, is adapted to include rent escalation and a limited protection against eviction. The results of the model show that those interventions (rent control and compulsory duration) entail some negative effects as they may drive some participants out of the tenancy market.

Therefore the model provides a partial-equilibrium explanation, based on the tenancy laws of various European countries, for the diminishing weight of the tenancy markets in Europe throughout the 20$^{th}$ century. As was emphasized in section 2, most European countries experienced the same evolution from a noninterventionist approach to tenancy relations towards a more regulated approach. Furthermore, the introduction of several legal restrictions on the tenancy market in several European countries coincided with a reduction in the proportion of rented dwellings in the housing market.

For instance, the reduction in the tenancy market share in Spain from 30.1% in 1970 to 20.8% in 1981 occurred while a very restrictive form of rent control and protection against eviction was in force. While that share continued to diminish in subsequent decades, the reductions were not as pronounced and the market tended to stabilize (also coinciding with less restrictive forms of regulation). Same reasoning can be employed for the case of Italy where the tenancy market suffered a severe reduction from 36% (as a share of the total stock of principal residences) in 1980 to just 22.5% in 1991 in tandem with quite severe restrictions of the tenancy contracts. However, in coincidence with the approval of milder regulations, data from 2004 (18.6%) show that the decreasing pattern continued, although at a slower pace. Same reasoning can be also utilized in the case of the UK. It must be recognized however that it is more difficult for a small share of the rental market to be further reduced. Finally, it is also interesting to highlight again the case of Finland, where the abrogation of the rent control rules and

the compulsory contractual periods (being the only case of such abrogation among the European countries analyzed) coincided with an increase in the weight of the tenancy market (24.7% in 1990 compared to 31% in 2004).

The limitations of this analysis which, for instance, does not take into account other important policy measures (such as taxation) should be borne in mind.

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## Appendix 1: Proof for expression 13

The demonstration of Lemma 1 of Basu and Emerson (2000) has been followed to provide a proof for 13.

The aim was to demonstrate that:

If $i < j$ then $v_i > v_j$

Lets assume that $t_j = t_{i+1}$ and that $v_j^k$ is the present value of rents earned by a landlord whose first $k$ tenants are of type $i$ and all others of type $j$.

It is possible to see that $v_j^1 > v_j$. For a rent $R=1$, $v_j^1$ is the following:

$$v_j^1 = 1 + \frac{\delta}{1+\gamma-\theta} + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i-1} + \delta^{t_i} v_j \tag{29}$$

And because $t_j = t_{i+1}$,

$$v_j^1 - v_j = \delta^{t_i} v_j - \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_i} - \delta^{t_i+1} v_j \tag{30}$$

$$v_j^1 - v_j = (1-\delta)\delta^{t_i}\left(v_j - \frac{\left(\frac{1}{1+\gamma-\theta}\right)^{t_i}}{(1-\delta)}\right) \tag{31}$$

So, it can be concluded that,

$$\frac{\left(\frac{1}{1+\gamma-\theta}\right)^{t_i}}{(1-\delta)} < v_j \tag{32}$$

That implies that $v_j^1 > v_j$. And as Basu and Emerson (2000) highlight, if $v_j^k > v_j^{k-1}$, as $\lim_{k\to\infty} v_j^k = v_i$, it must be true that $v_i > v_j$ ■

## Appendix 2: Proof for expression 16

The aim was to demonstrate that:

If $i < j$ then $v_{(i)} > v_{(j)}$

As already discussed, $v_k$ has the following value:

$$v_k = 1 + \frac{\delta}{1+\gamma-\theta} + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_k-1} + \delta^{t_k} v_k \tag{33}$$

That is,

$$(1-\delta^{t_k})v_k = 1 + \frac{\delta}{1+\gamma-\theta} + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_k-1} \tag{34}$$

Then, note that $v_{(i)}$ can be expressed as follows:

$$v_{(i)} = \frac{\sum_{k=i}^{n}\left(\frac{p_k}{\sum_{j=i}^{n} p_j}\right)\left[1 + \frac{\delta}{1+\gamma-\theta} + \left(\frac{\delta}{1+\gamma-\theta}\right)^2 + (...) + \left(\frac{\delta}{1+\gamma-\theta}\right)^{t_k-1}\right]}{1 - \sum_{k=i}^{n}\left(\frac{p_k}{\sum_{j=i}^{n} p_j}\right)\delta^{t_k}} \tag{35}$$

With 34 and 35 the following expression is obtained:

$$v_{(i)} = \frac{\sum_{k=i}^{n} \left( \frac{p_k}{\sum_{j=i}^{n} p_j} \right) (1-\delta^{t_k}) v_k}{1 - \sum_{k=i}^{n} \left( \frac{p_k}{\sum_{j=i}^{n} p_j} \right) \delta^{t_k}} \tag{36}$$

That after doing some algebra is also the expression used for 20,

$$v_{(i)} = \frac{\sum_{k=i}^{n} p_k (1-\delta^{t_k}) v_k}{\sum_{j=i}^{n} p_j - \sum_{k=i}^{n} p_k \delta^{t_k}} \tag{37}$$

$v_{(i)}$ is a weighted average of $v_i$, $v_{i+1}$, ..., $v_n$. If $j > i$ then $v_{(i)}$ is obtained from $v_{(j)}$ distributing the weight that $j$ had among the rest of the values of $v$ (*i.e.* for *i, i+1, ..., j-1*).

As a conclusion it is found that if $k < j$ and $v_k > v_j$ (done in the last section), then it must follow that $v_{(i)} > v_{(j)}$ (when $j < i$) ■