

Cholodilin, Konstantin; Kohl, Sebastian

**Article**

## Housing market regulation has contributed to the worldwide triumph of home ownership

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## AT A GLANCE

# Housing market regulation has contributed to the worldwide triumph of home ownership

By Konstantin Kholodilin and Sebastian Kohl

- The effects of rental market regulation are often discussed, but mostly in a short-term, national framework
- New set of international data allows for long-term analysis of the effects of rental market regulations
- Rent control and rationing of housing had a strong effect on home ownership rates in all countries examined
- Indirect effects on home ownership should be taken into account when designing rental market regulations
- Interests of both tenants and investors must be taken into account

### Rental market regulation has an effect on home ownership rates

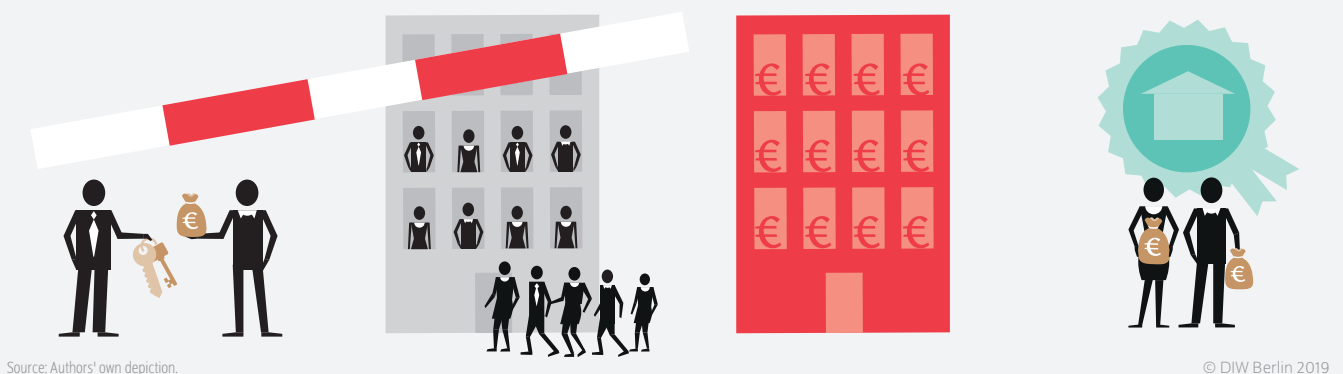
When rents are capped ...

... landlords put up their apartments for sale because renting them is not profitable enough any more.

... regulated housing remains affordable, renters hang on to their home, queues build up ...

... the rents of unregulated housing rise ...

... households looking for housing are forced into buying property.



## FROM THE AUTHORS

*“Especially in German cities there is lots of discussion around new measures to cap rents. Policymakers should be aware of the correlation between rental market regulation and home ownership rates. The more regulated the rental market, the more people live in their own homes, renters are in a way pushed out of the market.”*

— Konstantin Kholodilin, author —

# Housing market regulation has contributed to the worldwide triumph of home ownership

By Konstantin Kholodilin and Sebastian Kohl

## ABSTRACT

The present report presents new historical data based on country comparisons and research results regarding rent control and its long-term effect on the home ownership rate in 27 countries. Policy measures of rent control, protection against eviction, and housing space management have been widespread in most of the countries studied—particularly in continental Europe—in the past 100 years. At the same time, the rate of home ownership in those countries has steadily risen in the long term. The present analysis shows that in the past century, the triumph of home ownership has not only been the result of relevant incentive measures and financial market liberalization. Indirectly, it is also due to rent control.

The state has good reasons to pursue housing policy. In industrialized countries, such policy regulates the rental housing market. It does so for two reasons, first, to reduce the asymmetry between tenants and owners and second, to counteract short-term supply rigidity. If demand for housing rises suddenly, rent is expected to rise due to housing space scarcity. State regulation can moderate the rise and meet the responsibility of providing a roof over every head.

Rents have risen in Germany since 2010, which has pivoted the spotlight back to the subject of rent control. The pros and cons of the price-stabilizing “rent brake” (*Mietpreisbremse*) implemented in Germany in 2015 and other price-regulating measures are hotly debated and new models are in development. For example, the Berlin Senate is planning to implement a rent cap that freezes rents for five years.<sup>1</sup> More widespread application of the right of first refusal, a rent freeze in social conservation areas,<sup>2</sup> further tightening of the rent brake, restricting real estate purchases for foreigners,<sup>3</sup> and expropriation of the housing stock of private real estate companies<sup>4</sup> have been offered as solutions in some regions. Economists are wary of regulatory measures (see Box 1), such as intervention in free-market price setting, because they have a reputation for hindering investment in the long term, reducing tenant mobility, and raising the difference between rents for existing housing stock and new units.

Further, they distort the competition between the purchasing and rental markets that result from the interplay between supply (investors, landlords) and demand (tenants). On the supply side, the rental market is subject to price restrictions, while the home ownership market has remained free. When rents are capped (and as a result, landlords’ expected yields), it is rational for investors to pull out of the rental housing

<sup>1</sup> Berlin Senate Chancellery, “Senat beschließt Eckpunkte für ein Berliner Mietengesetz/Mietendeckel,” press release, June 18, 2019, (in German; available online, accessed June 20, 2019).

<sup>2</sup> Ulrich Zawatka-Gerlach, “SPD schlägt fünf Jahre Mietenstopp in Berlin vor,” *Der Tagesspiegel*, January 22, 2019 (in German; available online, accessed June 17, 2019; this applies to all other online sources in this report unless stated otherwise.)

<sup>3</sup> Julia Lohr, “Berlin will den Immobilienkauf für Ausländer einschränken,” *Frankfurter Allgemeine Zeitung*, August 27, 2018 (in German; available online).

<sup>4</sup> See the “Deutsche Wohnen enteignen” initiative website (in German); and Lena Klimpel, “Mit Enteignungen gegen Wohnungsnot?” *tagesschau.de*, April 5, 2019 (in German; available online).

segment. On the demand side (those seeking a place to live), rent stabilization initially makes renting a home more attractive. Since the supply of regulated apartments is scarce, however, queues form and the cost of finding an apartment rises significantly. Before regulatory intervention, tenant groups are highly heterogeneous, including well-to-do tenants and those with lower incomes. Tenants with higher incomes have a better chance of obtaining regulated apartments because from the landlords' viewpoint, their ability to pay is greater. On the other hand, tenants differ when it comes to patience. Those who already have an apartment in the relevant city have more time to look for a new apartment. Most newcomers urgently need a place to live. This is why they will take the ownership route, in which purchase costs are high but the costs of finding a home are relatively low. The expansion in the housing supply is also likely to lead to prices falling in that sector and even more people purchasing their own homes. However, it is not clear which effect has more weight, regulatory intervention in the price of renting or the price-depressing effect of additional housing in the market. Indeed, the latter is indirectly due to regulation.

The long-term effects of rent regulation on the housing market—on the size of the rental market in particular—have rarely been discussed. While much research has been done on home ownership and subsidized housing, empirical research on rental markets, in international comparison in particular, has been neglected.<sup>5</sup>

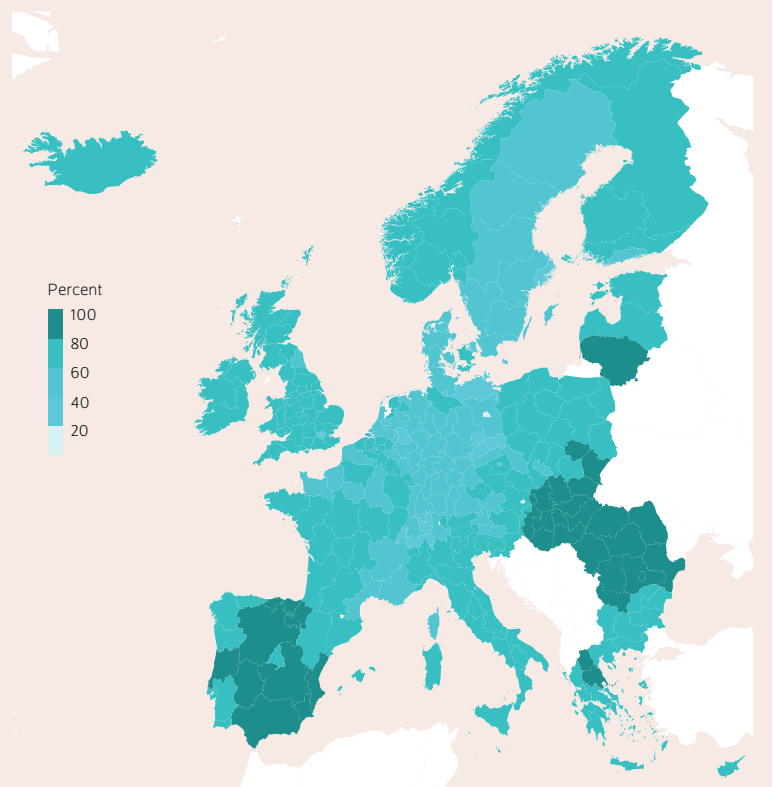
One reason for this is certainly the marked diffusion of home ownership in many countries and the political focus on subsidized housing. Even in countries with a low proportion of home ownership, such as Germany, the number of tenants has steadily decreased in the long term. Home ownership rates in Europe are very heterogeneous on the regional level (see Figure 1). While they are very high in some places at the periphery of the continent, significantly fewer households live in owner-occupied real estate in Central Europe. In Germany, 45.5 percent of the population rent their home, while in Switzerland the proportion is only 37.4 percent. Often, policy makers consider tenant households as “would-be-owners” and provide them with cheap loans, or they support them as “former owners.” For example, the state came to the rescue in Spain when many home-owners were unable to pay back their loans during the 2008–2009 economic crisis.<sup>6</sup>

Tenants comprise the majority of residents or a significant minority in many major cities in the countries studied. The way rental agreements are regulated is therefore a key component of housing policy.

The reasons for the comparatively low amount of rental market research include insufficient and inadequately comparable data. The situation has been considerably improved

Figure 1

### Home ownership rates in Europe In percent, for European regions<sup>1</sup>



<sup>1</sup> NUTS2 regions. The NUTS classification divides the European Union into easily comparable territorial units, see the European Commission [website](#) for more information.

Source: Eurostat, authors' own depiction.

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At the European periphery many own their homes; in central Europe the home ownership rates are lower.

thanks to new databases (see Box 2). Combining these enabled us to address the question of how rent regulation has affected the home ownership rate since it was initially implemented during World War I in western countries, and derive some implications for today's debate.<sup>7</sup>

## A brief history of rent regulation and home ownership

### Different rent regulation traditions

Based on the data and the rent regulation index derived from it (see Box 2), it is possible to outline the past 100 years of the history of rent regulation (see Figure 2). In most European countries, it began during World War I with strict price

<sup>5</sup> Most studies focus on the U.S. and some Scandinavian countries. None of the studies the authors are familiar with have an internationally comparative dimension.

<sup>6</sup> For example, the regions of Andalusia, Aragon, and Catalonia applied measures to protect households that could no longer pay their mortgages against foreclosure.

<sup>7</sup> The article summarizes the following current research findings of the authors, published in English: Konstantin Kholodilin et al., “Social Policy or Crowding-out? Tenant Protection in Comparative Long-run Perspective,” *DIW Discussion Paper* no. 1778 (2018) (available online). A shorter version appeared as: Konstantin Kholodilin and Sebastian Kohl, “Verdrängung oder Sozialpolitik? Der Effekt von Mietregulierung auf das Wohneigentum,” *Wirtschaftsdienst*, Volume 99, 2019, No. 5 (2019): 363–366.

## Box 1

**Policy tools for housing market regulation**

Housing policy is defined as the measures the state uses to influence the situation in the housing market. State interventions in the rental market often have the goal of supplying people with affordable, quality living space. This often serves a country's higher-level goals, including political, social, and economic stability.

The state has a wide range of tools to accomplish this goal. They can be divided into supportive or restrictive instruments. There are two kinds of supportive measures: property support (support for (subsidized) housing construction) and personal support (support for households in the form of a housing allowance). The restrictive instruments work on three levels: rent control, protection against eviction, and housing space management.

*Rent control.* The main goal of rent control is to protect tenants against speculative or excessive rent increases. When housing space is scarce, as a rule rents begin to rise—either due to the rate of new construction being too low in relation to the population increase, a decline in the housing stock due to war or natural catastrophe, or there is surplus demand in the rental housing market. In the short term, it is virtually impossible to adjust housing supply to demand. Given this situation, price regulation was originally established as a short-term solution. Later, it turned into a permanent intervention in market mechanisms.

Modern rent controls were initiated during World War I. Back then, the “first generation” of rent regulation was implemented. It is also the tightest form of such regulation and can be described as freezing rent prices. This type of rent control was often rolled back in the years after the war but experienced a widespread revival during World War II.

*Protection against eviction.* This policy's purpose is to reduce the risk of eviction for tenants. Popular instruments are laws on minimum terms for rental contracts or minimum legal requirements for termination of such contracts. The legal specification of pre-defined reasons for eviction such as personal need, delays in rent

payment, or disturbing the peace in the building plays a key role. Tenant protection has a special role in housing market regulation, since it closely corresponds to rent regulation. For example, certain types of tenant protection in combination with special price regulations—such as the legal minimum term for rental contracts when rents for the existing housing stock are regulated but rents for new apartments are not—can make rents rise to a significantly greater level than they would in an unregulated market.<sup>1</sup>

Before World War I, eviction law was extremely liberal everywhere in the world. Upon contract expiration, landlords could evict tenants without much effort. In the course of the 20th century, in many countries the legal situation changed to the advantage of tenants, who to this day benefit from robust protection against eviction. At the same time, regulation intensity has fluctuated over the past 100 years as it did in the case of rent control.

*Housing rationing.* The goal of this policy is to conserve scarce housing space. It is applied to both the supply and demand sides. On the supply side, measures designed to avoid the loss of apartments to the rental market are implemented. For example, rental units are often prohibited from being demolished, misappropriated, combined, or converted into condominiums. On the demand side, maximum standards for living space per person can be specified, or freedom of movement can be restricted by limiting the number of people who can move to areas with a strained rental market.

Some measures can be classified as housing policy by extension, including construction standards, urban planning, environmental protection, fiscal policy, and bank regulation. These measures can all affect the incentives in the residential real estate market.

<sup>1</sup> Jan Philipp Weber, “The Regulation of Private Tenancies – A Multi-Country Analysis,” dissertation at Universität Regensburg (2017).

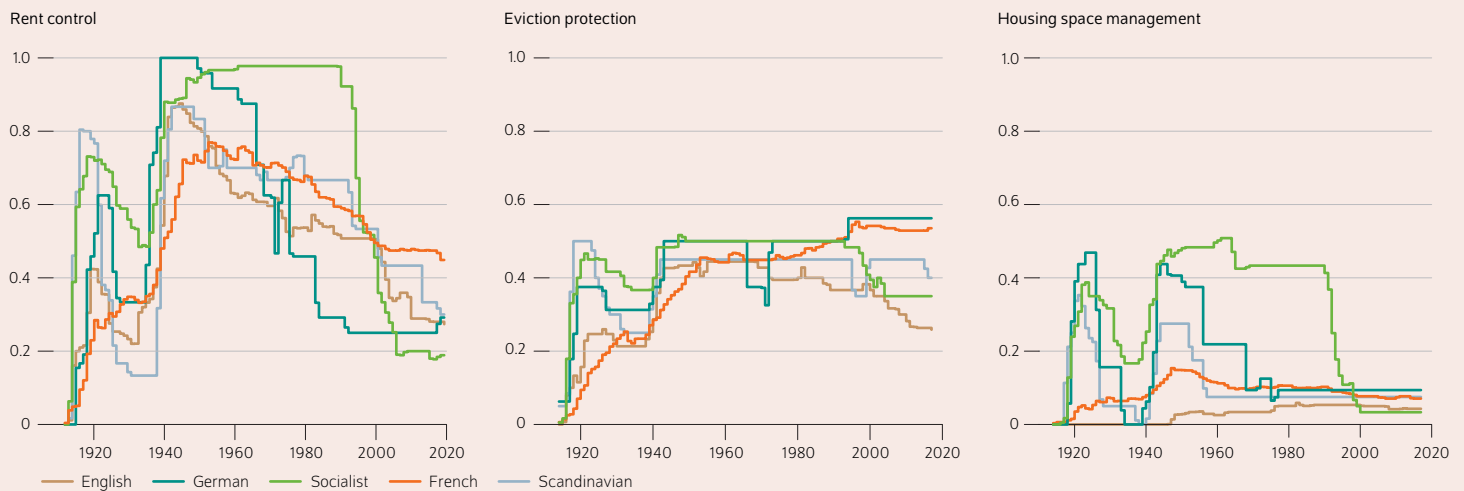
controls as an instrument of consumer protection on the home front. In the period between the wars, price regulation was often retained in a weaker form. It was revived during World War II and in continental Europe ultimately became the second-generation price controls of the second half of the 20th century. They permitted relative rent increases but indexed them to various indicators of the general increase in the cost of living.

In times of war and directly afterward, the rental housing market was the target of profound intervention, often in the form of wartime decrees. The measures even went as far as forced billeting. Many of the measures were then dismantled, but some—including social conservation areas (Milieuschutzgebiete) or restrictions on short-term rental

(such as Airbnb)—have survived and in recent years, even regained some importance. Protection against eviction also arose within the context of war and is still a component of rental law in some places today. Of course rental agreements were legally regulated before the war, but the laws were generally about renting in general and not specific to housing. When they did, they simply contained provisions against exorbitant rent increases (usury laws).

Wartime decrees were exceptional measures, but they were often incorporated into civil law after the war. These developments primarily affected countries in central and continental Europe. In southern and northern European countries, state intervention was somewhat more extensive than it was in countries with a Germanic legal tradition.

Figure 2

**Rental regulation intensity<sup>1</sup> by legal origin**

<sup>1</sup> See definition in Box 2.

Source: Authors' own calculations.

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Countries with a German legal tradition used to have strict rent control mechanisms, which have been softened over the past three decades.

That tradition of detailed regulation can be contrasted to the more liberal Anglo-Saxon way of doing things. In countries such as the U.S., for example, rents were also regulated during times of war or other crises (for example, during the oil crisis of the 1970s), but that remained an exception. After the war or when the inflation shock had ebbed, the regulations were gradually dismantled. A national rent policy did not emerge in the U.S. afterward, and therefore the relevant regulations of the country's cities have markedly different histories and levels of intensity.<sup>8</sup> Those countries did not develop strong tenant protection systems, and housing rental was often considered only a temporary residual form of housing with a social stigma attached.

### Varying prevalence of home ownership

Since World War I, the home ownership rate in Western countries has risen constantly, and it is converging at a high level (see Figure 3). South European countries and some in northern Europe have developed into strongholds of home ownership: Norway has a rate of 77.5 percent, for example. The rates there are even higher than those of the Anglo-Saxon countries, where home ownership was historically more firmly established. The German-speaking countries continue to lag behind (see Figure 1).

### Rent regulation has reduced the number of rental units

Home ownership has triumphed for many reasons: the generally higher level of prosperity, the ageing of society, an expansion in the housing stock, the spread of condominiums, steadily falling real interest rates, and in many countries, policy measures that support home ownership.

Multivariate time series analyses confirm these traditional explanations (see Box 3 and Table). For example, the dependency ratio of non-working age persons to the working age population has a positive influence on the increase in home ownership, whereas the long-term interest rate has a negative one. Surprisingly, the per capita GDP also has a negative influence, which might support the theory that in poorer countries, home ownership functions as insurance against negative economic trends.<sup>9</sup>

The analysis also shows that in the long term, tighter housing space management and rent price controls correlate with a rise in the home ownership rate. Protection against eviction, on the contrary, was found to be insignificant. The influence of rent control is not linear. Once rent control has reached a certain level (an index value of 0.79 or higher), tighter price controls do not correlate with a continued rise in the home ownership rate.

<sup>8</sup> Since World War II, the city of New York has had a rent regulation system in which first generation (rent control) and second generation (rent stabilization) regulatory elements both exist at the same time. See Timothy Collins, An introduction to the New York City rent guidelines board and the rent stabilization system (2016) (available online, accessed August 23, 2019). In California, on the other hand, the Costa-Hawkins Act has restricted municipal implementation of rent control systems since 1995.

<sup>9</sup> As an additional control variable, the purchase price-to-rent ratio has the expected negative sign (relatively higher purchase prices make home ownership less attractive), but the coefficient is not statistically significant. This is why the variable was not used in the present analysis.

## Box 2

## New data on home ownership and rent regulation

The new rent regulation data<sup>1</sup> include: regulation indexes on rent, tenant protection, housing space regulation, and the rate of ownership in 27 countries since World War I. They are: Australia, Belgium, Chile, Denmark, Germany, Finland, France, Greece, India, Ireland, Israel, Italy, Canada, Luxembourg, Morocco, New Zealand, the Netherlands, Norway, Austria, Portugal, Sweden, Switzerland, Singapore, Spain, South Africa, the UK, and the U.S. The data are based on a collection of all relevant historical rental laws in each country and the coded content of 18 binary categories: for example, if there is a real or nominal price freeze, if tenants have eviction protection, or if building demolition is prohibited. These categories were aggregated to create regulation indexes for the areas of

rent control, protection against eviction, and housing space management, plus a global index.<sup>2</sup> The higher the index value, which was standardized to values between 0 and 1, the tighter the rental market regulation.

The table shows the definition of the data, its sources, and some descriptive statistics (minimum, average value, maximum, and standard deviation). The panel is not balanced since the number of decades per country varies from two for Greece (from 2000–2010) to 11 for the U.S. (1910–2010). On average, the data cover five decades per country.

<sup>1</sup> The data set is still growing but has already been published. See Konstantin Kholodilin, Jan Philipp Weber, and Steffen Sebastian, "Rental Market Regulation over the Last 100 Years in an International Comparison," *DIW Weekly Report*, no. 45 (2018): 453–464 (available online), and <https://www.remain-data.org/>.

<sup>2</sup> For more detailed information, see Konstantin Kholodilin, "Measuring Stick-Style Housing Policies: a Multi-Country Longitudinal Database of Governmental Regulation," *DIW Discussion Papers*, no. 1727 (2018) (available online); and Jan Philipp Weber, "The Regulation of Private Tenancies – A Multi-Country Analysis," dissertation at Universität Regensburg (2017).

## Table

## Data description

Description	Source	Period	Minimum	Mean	Maximum	Standard deviation
Home ownership rate defined as a share of owner occupied dwellings in total housing stock, in percent	Kohl (2017) <sup>1</sup> , Compendium of Housing Statistics of the UN, national statistical offices	1910–2018	19.950	59.149	96.175	16.230
Rent laws index, [0,1]	Own calculations	1910–2017	0.000	0.429	1.000	0.372
Square of rent laws index, [0,1]	Own calculations	1910–2018	0.000	0.338	1.000	0.354
First-generation rent control index, [0,1]	Own calculations	1910–2018	0.000	0.439	1.000	0.466
Second-generation rent control index, [0,1]	Own calculations	1910–2018	0.000	0.068	1.000	0.241
Tenure security index, [0,1]	Own calculations	1910–2018	0.000	0.317	1.000	0.251
Housing rationing index, [0,1]	Own calculations	1910–2018	0.000	0.092	0.875	0.163
Rental market regulation index, [0,1]	Own calculations	1910–2018	0.000	0.373	0.833	0.285
Condominium dummy (1, if condominium law is active)	Own calculations	1910–2018	0.000	0.425	1.000	0.482
Real GDP per capita, 1990 international Geary-Khamis dollars	Maddison Project Database	1910–2016	0.521	11.050	77.638	12.320
Ratio of dependent (younger than 15 and older than 64 y.o.) population to working-age (15 through 64 y.o.) population, [0,1]	World Development Indicators of the World Bank and European University Institute	1899–2016	0.255	0.614	1.113	0.157
Housing completions by 1000 inhabitants	Kohl (2018) <sup>2</sup>	1860–2010	0.251	5.437	15.203	2.765
Long-term interest rate, in percent	Macrohistory database, OECD	1870–2017	0.670	6.175	87.376	6.132

<sup>1</sup> Sebastian Kohl, "Homeownership, Renting and Society: Historical and Comparative Perspectives" London: Routledge (2017).

<sup>2</sup> Sebastian Kohl, "Too much mortgage debt? The effect of financialization on new construction and residential capital investment," unpublished manuscript (2018).



The effect of rent control on the home ownership rate may be due to two factors. First, the landlords of regulated apartments can no longer rent them profitably and subsequently offer them up for sale.<sup>10</sup> Second, there are also non-regulated apartments and their rents rise faster than they would in the absence of regulation.<sup>11</sup> The market is obviously divided into two segments. The first is a regulated market with very low rents and tenant households that do not want or are not able to give up their apartments because they would not be able to rent under such good conditions anywhere else; the second is a free market with very high rents. In many countries with a similar market structure, for example Sweden or the United Kingdom, many people are forced to become home owners because they cannot find affordable apartments to rent.

Other factors may have played a role in the spread of home ownership, such as direct support for home ownership and financial market liberalization. For the period starting in 1970, these factors can be measured in two indexes. On the one hand, for several decades experts from OECD countries have been asked how effective they think the measures in support of home ownership are. This index is indeed able to provide a partial explanation of the increase in the home ownership rate.<sup>12</sup> On the other hand, the International Monetary Fund (IMF) summarized the degree of financial market liberalization in many areas (the development of securitization markets, for example) and in many countries into a financial reform index.<sup>13</sup>

Adding these two indexes to the estimate does not change the main finding that rent control has a positive influence on the home ownership rate.

The findings point in a direction similar to the one indicated by anecdotal evidence and American studies:<sup>14</sup> profound intervention in rent prices or the housing stock causes landlords to sell their rental units to tenants. When income is rising, more and more tenants can afford to purchase their homes. In the context of rising housing scarcity—exactly the circumstances under which rent control is applied most intensively—many have no choice other than to purchase their homes.<sup>15</sup> With the spread of alternative investment opportunities such as stocks, flight from the rental market becomes a real option.

<sup>10</sup> A similar effect is expected for Berlin as a result of the planned rent cap. See Ralf Schönball, "Sieben Thesen zum geplanten Mietendeckel," *Der Tagesspiegel*, June 17, 2019, (in German; available online).

<sup>11</sup> See Konstantin Kholodilin, Andreas Mense, and Claus Michelsen, "Mietpreisbremse ist besser als ihr Ruf, aber nicht die Lösung des Wohnungsmarktpblems," *DIW Wochenbericht*, no. 7 (2018): 107–117 (available online).

<sup>12</sup> Mikael Atterhög, "The Effect of Government Policies on Home Ownership Rates: An International Survey and Analysis," in *Home Ownership: Getting in, Getting from, Getting out*, eds. John Doling and Marja Elsinga (Amsterdam: Delft University Press, 2006), 7–34.

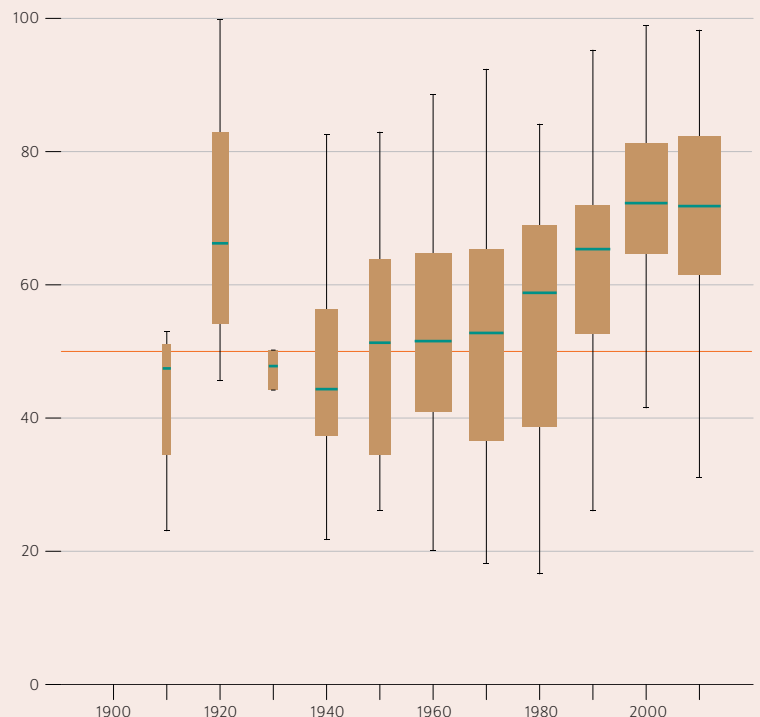
<sup>13</sup> Abdul Abiad, Enrica Detragiache, and Thierry Tresselt, "A New Database of Financial Reforms," *IMF Working Paper* 8/266 (2008) (available online).

<sup>14</sup> Daniel K. Fetter, "The Home Front: Rent Control and the Rapid Wartime Increase in Home Ownership," *NBER Working Paper*, 19604 (2013) (available online) studied the rise in the home ownership rate in the U.S. in the wake of price controls during and after World War II.

<sup>15</sup> Fetter, *The Home Front*.

Figure 3

### Worldwide home ownership Home ownership rate in percent



Sources: Comisión Económica para América Latina y el Caribe (CEPAL), United Nations Statistics Division (UNSD), national statistics offices, authors' own depiction.

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Up to the global financial crisis of 2008–2009 the home ownership rate rose steadily, since then it has been stagnating or even declining.

### Conclusion: rent control has long-term effect on home ownership and policy measures must take this into account

Housing market regulation is a social policy instrument with a long history. It is used worldwide on a regular basis. It balances out the interests of landlords and tenants and takes into account that homes are an economic good with many special features. Supply is inflexible in the short term, and waves of strong demand trigger very strong price reactions. This can cause households to spend larger and larger proportions of their income on rent<sup>16</sup> and get pushed out of the rental market, eroding social structures and causing parts of the population to lose access to the regular housing market. Such trends can be observed in many German cities, and the pressure on policy makers to counter the development is growing. On the other hand, real estate is an investment good whose appeal is determined to a great extent by its flexibility of use and the opportunity to generate profits. There is obviously a long-term relationship between the supply of rental housing and the intensity of regulatory intervention, just as

<sup>16</sup> See Christian Dustmann, Bernd Fitzenberger, and Markus Zimmermann, "Housing expenditures and income inequality", *ZEW Discussion Paper*, No. 18-048 (2018) (available online, accessed September 2, 2019).



Table

## Influence of selected factors on the home ownership rate

	Model 1	Model 2	Model 3	Model 4
Rent control in previous decade	10.08*** (2.88)			21.86* (9.09)
Rent control (squared) in previous decade				-12.20 (8.93)
First-generation <sup>1</sup> rent control in previous decade			3.30 (1.83)	
Second-generation rent control in previous decade			-0.56 (2.80)	
Protection against eviction in previous decade	2.46 (3.61)		3.80 (4.57)	0.81 (3.79)
Housing space management in previous decade	6.46 (8.47)	7.73 (8.52)	6.90 (8.90)	3.72 (8.66)
Aggregated regulation in previous decade		14.29** (4.62)		
Dependence ratio	24.66 (13.64)	23.21 (13.76)	21.15 (14.59)	19.80 (14.03)
GDP per capita	-12.51* (4.79)	-10.96* (4.75)	-12.76* (5.05)	-12.19* (4.77)
Housing completions per 1,000 inhabitants	5.93** (1.74)	5.55** (1.75)	5.25** (1.82)	6.29*** (1.75)
Interest rate	0.622* (0.328)	0.661** (0.331)	0.686** (0.343)	0.674** (0.329)
Possibility of buying single units	-1.282 (2.240)	-0.913 (2.252)	-1.452 (2.348)	-1.476 (2.233)
R <sup>2</sup>	0.29	0.27	0.23	0.31
Adj. R <sup>2</sup>	-0.08	-0.10	-0.18	-0.07
Observations	130	130	130	130

1 See Box 1.

2 Refers to the first-time introduction of the possibility to buy single apartments. According laws were passed in the 1950s and 1960s. Prior to that, it was usually possible to buy entire apartment buildings only.

Reading example: the first figure (10.08) means that any increase of 0.1 in the rent control intensity corresponds to a one-percent increase of the home ownership rate.

Significance levels: \* p<0,10, \*\* p<0,05, \*\*\* p<0,01.

Source: Authors' own calculations.

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## Box 3

## Estimation methods

Since the existing data have two dimensions (time and countries), the estimates were based on panel data models. The model was formulated like this:

$$y_{it} = \beta'x_{it} + \gamma'r_{i,t-1} + \mu_i + \delta_t + v_{it}$$

in which  $y_{it}$  stands for the change in home ownership rate (WEQ) of country  $i$  in decade  $t$  in comparison to the previous decade;  $x_{it}$  is a vector of the control variables;  $r_{it}$  is the vector of the rent regulation index (here the data are taken with a time delay of one decade here to avoid possible endogeneity);  $\mu_i$  are country-specific fixed effects,  $\delta_t$  are decade-specific fixed effects, and  $v_{it}$  is the error term. Home ownership rates were differentiated to correct for possible autocorrelation. The estimates were carried out with country-decades as cases, since home ownership rates are surveyed relatively infrequently and the annual time series would have too many gaps.

the demand for rental housing is likely to be determined by regulation: higher levels of tenant protection increase the appeal of renting in the short term.

The present report shows that the intensity of the regulation leads to a different balance in the stock of rental units and condominiums in the long term. Part of the globally observed difference among home ownership rates can be explained by differences in regulatory intensity. The evidence based on micro data also supports this relationship.<sup>17</sup>

This must be considered when planning further intervention in the housing market, as currently under discussion in many German cities—Berlin in particular. The more profound the market intervention, the greater the long-term negative effect on the supply of rental units. When designing new regulatory measures for the rental market, the balance between the interests of tenants and those of investors must be preserved.

<sup>17</sup> Rebecca Diamond, Timothy James McQuade, and Franklin Qian, "The effects of rent control expansion on tenants, landlords, and inequality: Evidence from San Francisco," *American Economic Review* 109 (9) (2019): 3365–3394.

**Konstantin Kholodilin** is a Research Associate in the Macroeconomics department at DIW Berlin and Professor at the NRU HSE St. Petersburg | kkhodilin@diw.de

**Sebastian Kohl** is a Senior Researcher at the Max-Planck Institut for the Study of Societies | kohl@mpifg.de

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DIW Berlin — Deutsches Institut für Wirtschaftsforschung e. V.

Mohrenstraße 58, 10117 Berlin

[www.diw.de](http://www.diw.de)

Phone: +49 30 897 89-0 Fax: -200

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