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## The hidden homeownership welfare state: An international long-term perspective on the tax treatment of homeowners

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# 1972

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Konstantin A. Kholodilin, Sebastian Kohl, Artem Korzhenevych and Linus Pfeiffer

Opinions expressed in this paper are those of the author(s) and do not necessarily reflect views of the institute.

#### IMPRESSUM

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# The hidden homeownership welfare state: An international long-term perspective on the tax treatment of homeowners<sup>☆</sup>

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## Abstract

Welfare is traditionally understood through social security decommodifying labor markets or social investment policies. In the domain of housing, however, welfare for homeowners is largely hidden in the tax codes' fiscal exemptions. Based on a content analysis of legislation, this paper introduces a novel yearly database of 37 countries between 1910 and 2020 to uncover the “hidden welfare state” of taxes on imputed rent, deductibility of mortgage payments, housing capital gains tax and VAT on newly built dwellings. Summary indices of homeownership attractiveness and neutrality of the tax code show that fiscal homeownership policies have been in decline until the 1980s and risen ever since. They are in place where finance is liberally and labor restrictively regulated. Contrary to the classical welfare state, they are not associated with an economic logic of industrialism or left-wing governments, but a rent-regulation alternative of Common-Law jurisdictions and smaller countries. As welfare for property owners, the logic of fiscal homeownership welfare diverges from the classical welfare for the laboring classes.

**Keywords:** homeownership taxation attractiveness; tenure neutrality; leximetrics; international longitudinal data.

**JEL codes:** C43, H24, K25, R38.

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## 1. Introduction

Traditionally, the welfare state is seen as the very visible complex of social security programs which provide income support in case of old age, accident, unemployment, maternity and sickness. A broader understanding might as well add labor activation programs, education or social investment to the sum of social expenditures (Nikolai, 2012). More recently, broader conceptions of welfare have been suggested: particularly in times of traditional welfare retrenchment, “social policies by other means” have come to play a more important role (Seelkopf and Starke, 2019). One such central policy instrument are fiscal exemptions, as when states willingly forgo tax income under certain conditions to subsidize economic activities. Below the visible surface of the social-security contributions and direct transfer programs, these rather hidden fiscal expenditures have grown into an additional welfare pillar, ever since first estimates became available in the 1970s (Pollard, 2011). One, if not the central, component of this hidden welfare state is in the policy domain of housing. It particularly favors homeownership, which accounts for large parts of fiscal expenditure in the US (Howard, 1999). Yet, whereas direct welfare regulations have been extensively measured and explained across countries in terms of the logic of industrialism, power resources or polity effects, the cross-country measurement or let alone theorizing on the hidden housing welfare state is virtually non-existent within comparative political economy.

This study fills this gap by presenting a unique and novel regulation database which traces four major fiscal exemptions for homeowners over a century, starting in 1914, when first modern tax codes came into being and currently covering a total of 37 OECD and non-OECD countries. Ever since, states could allow homeowners to not pay imputed rent tax, to deduct mortgage interest payment from income taxes and housing capital gains from capital gains taxation as well as to not pay value added tax (VAT) on new housing construction. Through a content coding of countries’ major tax codes, we use these four binary variables to see how favorable it treated homeowners and to what extent it was biased towards homeownership as tenure. Over time, we find that there was a rise, fall and re-emergence in the 1990s of the homeownership attractiveness of tax codes. It generally correlates positively with liberal regulation in finance and the rule of law and negatively with labor market regulation, as measured by other existing indices.

Furthermore, the paper explores to what extent typical theories from classical welfare state research carry over to the study of the hidden housing welfare state of fiscal exemptions. Contrary to traditional welfare, we find that partisan effects hardly play a role for homeownership welfare and if anything, left government are negatively associated. Contrary to a “logic of industrialism”, economic development, if at all significant, is also negatively associated with tax welfare, which often sets in as stimulus in depressions. Rather, modern state capacity is positively associated with fiscal exemption policies. The strongest predictor throughout is a countries’ legal origin and polity: again contrary to classical welfare, Anglophone countries display the strongest and Scandinavian ones the weakest homeownership preference in the tax code. Overall, these results put classical-welfare explanations on their head. Finally, social expenditure are positively associated with homeownership welfare, rent regulations negatively so.

The study contributes to the literature that compares tax systems in historical-comparative perspective ([William Martin and Prasad, 2014](#)) and links this literature with the classical welfare-state studies ([Beramendi and Rueda, 2007](#)). Introducing a novel database, it extends this research into the domain of fiscal expenditure and homeownership welfare and shows substantively that the two follow different explanatory logics. The regulatory trade-off seems to be less one between homeownership and welfare, as asset-based welfare conceptions might suggest ([Doling and Ronald, 2010](#)), but rather between supporting homeowners fiscally and supporting tenants legally.

The study is organized as follows. In section [2](#), we review some theories concerning classical welfare state development to formulate theoretical expectations for understanding homeownership fiscal welfare. In section [3](#), we explain the general tool-kit of homeownership and housing taxation policies. Section [4](#) explains the approach used to quantify these tools. In section [5](#), the findings on the evolution of the homeownership tax treatment over time and space, its relationship to other types of regulations, and its determinants are discussed. Finally, section [6](#) concludes.

## 2. Explaining homeowner supporting policies

To our knowledge, we are the first to explain the existence or absence of homeownership-supportive policies in a large sample of countries over time. There is hence not a very established body of existing quantitative literature that we could easily draw upon in terms of theoretical expectations. Yet, there are obviously many country-specific studies detailing qualitatively why certain homeownership-friendly policies have come into place. Moreover, homeownership-supportive policies can arguably be seen as a part of global welfare state development, usually meaning the introduction of the four social insurances: accident, pensions, health, and unemployment. These were introduced in roughly this order in almost all countries throughout the 20<sup>th</sup> century in a global diffusion process ([Schmitt et al., 2015](#)), starting with Bismarck in Germany in 1883. While the OECD has gradually broadened the definition of “social expenditure” to also include maternity, labor market activation and even housing allowances (most paid to tenants) after 1980, the considerable expenditure in favor of homeowners has long gone unnoticed.

One reason for this oversight is that homeownership-welfare differs in two dimensions from the traditional social-insurance-based welfare. First, it mainly comes in the form of fiscal expenditure and has therefore been considered part of the “hidden welfare state” ([Howard, 1999](#)). Social housing programs did also include direct transfers to homeowners in a number of countries, particularly those with a “socialized homeownership” regime where basically all government subsidies go to homeowners ([Norris, 2016](#)). Some countries, such as Germany, also support ex-ante savings earmarked for housing with bonuses and transfers ([Börsch-Supan and Stahl, 1991](#)). Yet, a large share of homeownership subsidies comes in the form of exemptions from taxes, mainly from income, capital-gains and value-added taxes, and of all fiscal exemptions, the housing exemptions are one of the largest items ([Pollard, 2011](#)). Their politics are rather hidden, because fiscal expenditure are rather technical and only known at the end of fiscal years.

Second, fiscal expenditure by their very definition only regard residents obliged to pay taxes. Without income, capital or new production to be taxed, no taxes can be claimed back from the state. This implies that homeownership welfare presupposes a certain economic standing to apply. It is not welfare directed at the have-nots, but it is also different from universal social

insurances because it targets only a selected group in the population, most probably with an above-average income. The income-tax progressivity can make fiscal expenditure regressive in nature. In this, homeownership could share some similarities with other peripheral welfare domains such as (higher) education, which has a similar middle-class status-good character as housing. To the extent that middle-classes have also been addressed by traditional social security policies ([Iversen and Soskice, 2006](#)), we could nonetheless expect basic similarities of homeownership and conventional welfare as well which we summarize in a first guiding hypothesis:

*Welfare hypothesis: Homeownership-supportive policies share basic characteristics across countries and over time with conventional welfare policies.*

To explain the presence and extent of homeownership policies, it could therefore be useful to draw on more general welfare-state theories. Moreover, understanding housing in terms of the welfare state has a certain, not uncontested tradition ([Stephens, 2016](#); [Blackwell and Kohl, 2019](#)). A first set of theories relates to basic fundamentals explaining homeownership welfare. According to the logic of industrialism ([Wilensky, 1975](#)), richer countries are accordingly rather able to afford welfare of any kind, including fiscal benefits to homeowners. We would therefore expect higher economic development to be associated with more homeownership support. A specifically relevant fundamental for homeownership policies obviously is the extent of owner-occupied housing in a society. The higher the homeownership rate and rate of indebted homeowners, the more a homeownership-focused welfare state would matter. Population size and growth could be a second fundamental driver: smaller countries can find it easier to implement redistributive subsidies in general, whereas stronger population growth may require to make use of homeownership policies as construction incentive to cope with supply shortages. Other than economic or demographic fundamentals, homeownership policies could simply be part of modernization of governance: they obviously require a certain state capacity to be implemented, such as the rise of the fiscal state with its survey and information capacity. All this could lead us to expect the:

*Fundamentals hypothesis: Homeownership-supportive policies can be explained by basic economic, demographic, or state-capacity fundamentals.*

Beyond fundamentals, politics is obviously an important dimension to understand why

certain countries or time periods preferred homeownership-supportive policies, while others did not. Welfare policies have been traditionally seen as a resort of the political left who have a stronger preference for redistributive policies. Yet, most historical social-insurance laws were actually passed by conservative, particularly Christian conservative parties and perhaps only indirectly influenced by the left through its rising opposition (Manow and van Kersbergen, 2009). Homeownership policies with their middle-class focus have also been found to be the traditional fosterchild of conservative parties and have only been supported by the left in some country groups and rather in more recent periods, when lower-income families equally came to live in homeownership (Kohl, 2020). More historically and in the German-speaking and neighboring countries, for instance, the political left was rather in favor of urban tenants and hence of a stronger regulation of tenancy. If the rental market is well regulated, one might expect, homeownership policies might be needed less. To the extent that voters of traditional left-wing parties underwent processes of *embourgeoisement* with ever higher participation in higher-income groups, education and homeownership (Häusermann, 2018; Hadziabdic and Kohl, 2021), parties of the left may have also become a major driver of homeownership-favoring measures. Homeowners usually do not form additional organized groups beyond political parties to defend their interests, while tenant organization, though existent, face recurrent problems of collective actions and are not as politically important as unions in labor and welfare politics. We therefore expect politics to be mainly driven by partisan logic:

*Partisan hypothesis: Homeownership-supportive policies can be explained by the relative strength of the political right and left.*

Finally, the political and legal system itself can be an important determinant of how welfare policies, including homeownership ones, are designed. In the Anglophone two-party systems, for instance, both parties tend to favor homeowners, as they are an important constituency no party can afford to ignore. Countries' tax regimes also differ and can be stronger based on indirect taxation, such as in Scandinavian countries (Beramendi and Rueda, 2007), or on income taxes, as in most of continental Europe.

*Polity hypothesis: Homeownership-supportive policies can be explained by features of the political and fiscal system.*

Equipped with these four expectations derived from classical welfare state study, we now

turn to introducing the measurement of homeownership support and taxation.

### 3. Tax treatment of the owner-occupied housing

Most countries foster homeownership in some way. Traditionally, the homeownership policies are found in the manifestos of conservative parties and are particularly pronounced in Anglophone countries (Kohl, 2020). In German speaking countries, by contrast, Social Democrats in particular were rather skeptical about homeownership subsidies and either introduced it quite late in their party manifestos or did not consider it as a central objective of their housing policy. The political parties that propose homeownership subsidies not only for reasons of housing provision but also for family values —, wealth-formation—, or democracy-oriented objectives. This translated into a number of different subsidy schemes.

On the one hand, homeownership can be promoted through direct subsidies. In countries with a tradition of “socialized homeownership” such as Ireland or Iceland, future homeowners have been eligible to subsidized loans or government transfers (Sveinsson, 2000). For example, in Germany these are housing construction bonuses (*Wohnungsbauprämie*) and family housing grants (*Baukindergeld*) (Kohlhase, 2011). On the other hand, homeownership can be stimulated through the taxation system. In this study, we will focus on this second element of subsidy policies. In the literature, the following four types of instruments are mainly considered: taxes on imputed rent, interest relief on mortgage repayments, capital gains tax on housing, and the value added tax on new dwellings (Haffner, 1992; van Weesep and van Velzen, 1995; MacLennan et al., 1998; Stephens, 2003; Wolswijk, 2009; Figari et al., 2012). Below, we introduce each tax and exemptions in turn.<sup>1</sup>

#### 3.1. Imputed rent tax

Taxes on imputed rent must be paid by the owner for the dwelling she occupies. It is justified by the fact that homeowners, unlike renters, do not pay any rent and therefore have an additional source of income. Especially, if at the same time the mortgage interest can be deducted from the income tax (see below), a bias in favor of homeowners emerges. The tax on

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<sup>1</sup>We purposefully refrain from considering real estate transfer and the property taxes here. These taxes are levied on both owner- and tenant-occupied housing and should therefore not affect the tenure neutrality.

imputed rent is aimed at restoring tax neutrality. In order to evaluate the amount of the unpaid rent, the fiscal authorities estimate a monetary use value of the owner-occupied dwelling. The tax is expected to reduce the formation of homeownership. On the other hand, since the use value of the housing can be considered as an additional income, the failure to collect such a tax would mean an unequal treatment of other types of income and, hence, a stimulation of the homeownership. The collection of this tax is often complicated, because the use value is difficult to assess correctly. Moreover, the absence of a tax on imputed rent represents a subsidy, which does not discriminate between the newly built and existing housing. Thus, everyone occupying own dwelling can benefit from it.

### *3.2. Tax deductibility of mortgage payments*

The possibility to deduct mortgage interests goes often hand in hand with the imputed rent tax. It follows the logic that the cost incurred to obtain an additional income (non-payment of rent) must be deductible. In some countries, the possibility of mortgage interest relief exists even in the absence of an imputed rent tax. The interest deductibility makes the purchase of a home more attractive. This can generate, however, the risks of a build-up of speculative price bubbles.

### *3.3. Capital gains tax*

This tax is imposed in cases when the owner makes profits resulting from the positive difference between the price at which one sells the dwelling and the price at which one acquired it, provided that this difference cannot be entirely related to the improvements made to the dwelling. The capital gains tax tends to make the purchase of housing less attractive. One of the disadvantages of the homeownership compared to renting is a reduced flexibility. Typically, it takes more time to sell an owner-occupied home than to terminate a rental contract. An absence of the capital gains tax could compensate for such a disadvantage and eventually make it more attractive for renters to become homeowners. On the other hand, it could create incentives for speculating with housing, since the absence of the capital gains tax for housing would make it more attractive than other assets (e.g., shares), which are subject to such a tax. This could stimulate the formation of speculative housing price bubbles and, hence, make it more difficult for the low- and middle-income households to purchase homes. Therefore, the

capital gains tax on housing is sometimes conceived as a speculation tax from which the owners, who really occupy their dwellings, are exempted.

### 3.4. VAT on the new dwellings

The value added tax on newly built dwellings is added to the purchase price of a dwelling offered for sale. As a result, housing becomes more expensive and less attractive to buy. At the same time, exactly as in the case of the imputed rent tax, the VAT for new dwellings allows treating housing similar to other goods, which are subject to VAT. Hence, the absence of the VAT on housing can be considered as a subsidy. Unlike the absence of the tax on imputed rent, the absence of the VAT allows to make to stimulate the construction of new dwellings.

## 4. Quantification of taxation attractiveness and tenure neutrality

In order to be able to assess the impact of these forms of housing taxation, they have to be measured in numeric terms. The coding of regulations is a difficult task, since it has to strike a balance between reflecting the essence of legal acts and producing interpretable and objective indices. Surely, the regulations are very complex and trying to mimic them in a detailed way would make their quantification infeasible. Therefore, certain simplifying restriction must be imposed in order to render the task tractable. For example, we only account for the existence of the taxes, not for their rates or application sphere.

### 4.1. Leximetric approach to taxation policies

Here, we apply the methodology, which is known as *leximetrics*, used since at least the early 1990s to measure the intensity of governmental regulations. Leximetrics is employed in a large variety of areas of economics, such as labor markets, finance, shareholder protection, and housing.<sup>2</sup> There are several studies examining homeownership taxation (e.g., [Wolswijk, 2009](#); [Figari et al., 2012](#)). However, none of them intends to quantify the regulations. The first researcher to quantify the housing ownership policies was [Atterhög \(2005\)](#). Based on expert surveys conducted in 18 countries, he built six indices (direct grants for buying, other subsidies, mortgage deduction, grant tax deduction, low property tax, and homeownership allowances)

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<sup>2</sup>[Kholodilin and Pfeiffer \(2021\)](#) thoroughly discuss various leximetric applications.

covering the period between 1970 and 2000 at decade frequency. His indices vary between 0 (no support) and 5 (very generous support). Thus, our databases partly overlap (countries, periods, and policies). However, our data have annual frequency, are based on regulation and not expert opinion, and cover a much longer period. In addition, our database and that of Atterhöf share only one common policy index — the mortgage deduction.

Barrios et al. (2019), on the other hand, consider five homeownership policy indicators (transfer taxes, recurrent property taxes, capital gains taxes, imputed rent taxation, and mortgage interest deduction) to show the distortions for households decisions by computing the cost of owner occupied housing. Their policy indicators are similar to the ones that we use in this study, except for their additional implicit recurrent property taxes. Another difference is that they measure transfer and capital gains taxation in absolute terms rather than as a dummy variable. Their sample comprises 28 EU countries between 1995 and 2017.

While these approaches examine the existence or magnitude of housing taxation policies, Seelkopf et al. (2021) take another dimension of taxation policies into account, which is the year of introduction of the corresponding tax. They achieve this by constructing a new data set on the year and mode of introduction of six key modern taxes (personal income tax, corporate income tax, social security contributions, inheritance tax, general sales tax, and value added tax) in 220 countries between 1750 and 2018. While this is a useful database for the introduction of general tax codes, it is not specific enough for the subdomain of housing and homeownership.

#### 4.2. Our approach

In this study, we follow the approach suggested in Kholodilin (2017, 2020); Weber (2017), who measure the intensity of rental market regulations worldwide over a long period. First, we conduct an overview of the relevant legislation pieces in order to extract information concerning the tax treatment of owner-occupied dwellings.<sup>3</sup> Second, for each of the four taxation types discussed above, a binary index is constructed that equals one, if regulation is more favorable

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<sup>3</sup>A complete list of these legal acts can be accessed online in the *Longitudinal database of homeownership taxation: Documentation*, [https://rpubs.com/Konstantin\\_Xo/HOTI](https://rpubs.com/Konstantin_Xo/HOTI). In addition, short country summaries are presented in Appendix B.

with respect to homeowners, and zero, otherwise:

$$I_{jt} = \begin{cases} 1, & \text{if taxation of type } j \text{ is favorable to homeowners in period } t \\ 0, & \text{otherwise} \end{cases} \quad (1)$$

Thus, the binary indices for the imputed rent tax, capital gains tax, and VAT are equal to 1, when the homeowners are not subject to these taxes, while the binary index for interest deductibility is equal to 1, when such an option is provided to homeowners. The resulting binary indices are plotted in Figures 1 through 4 as shaded areas. Each horizontal bar corresponds to an individual country. The darker shades of grey correspond to regulations that are more beneficial for homeowners. Yellow color denotes missing observations.

A composite homeownership taxation attractiveness index is computed as a simple average of binary variables:

$$\text{HOTA}_t = \frac{1}{J} \sum_{j=1}^J I_{jt} \quad (2)$$

where  $J = 4$  is the number of individual binary taxation indices. Hence, the index can vary between 0 and 1. The higher its values, the more favorable the housing taxation for homeowners.

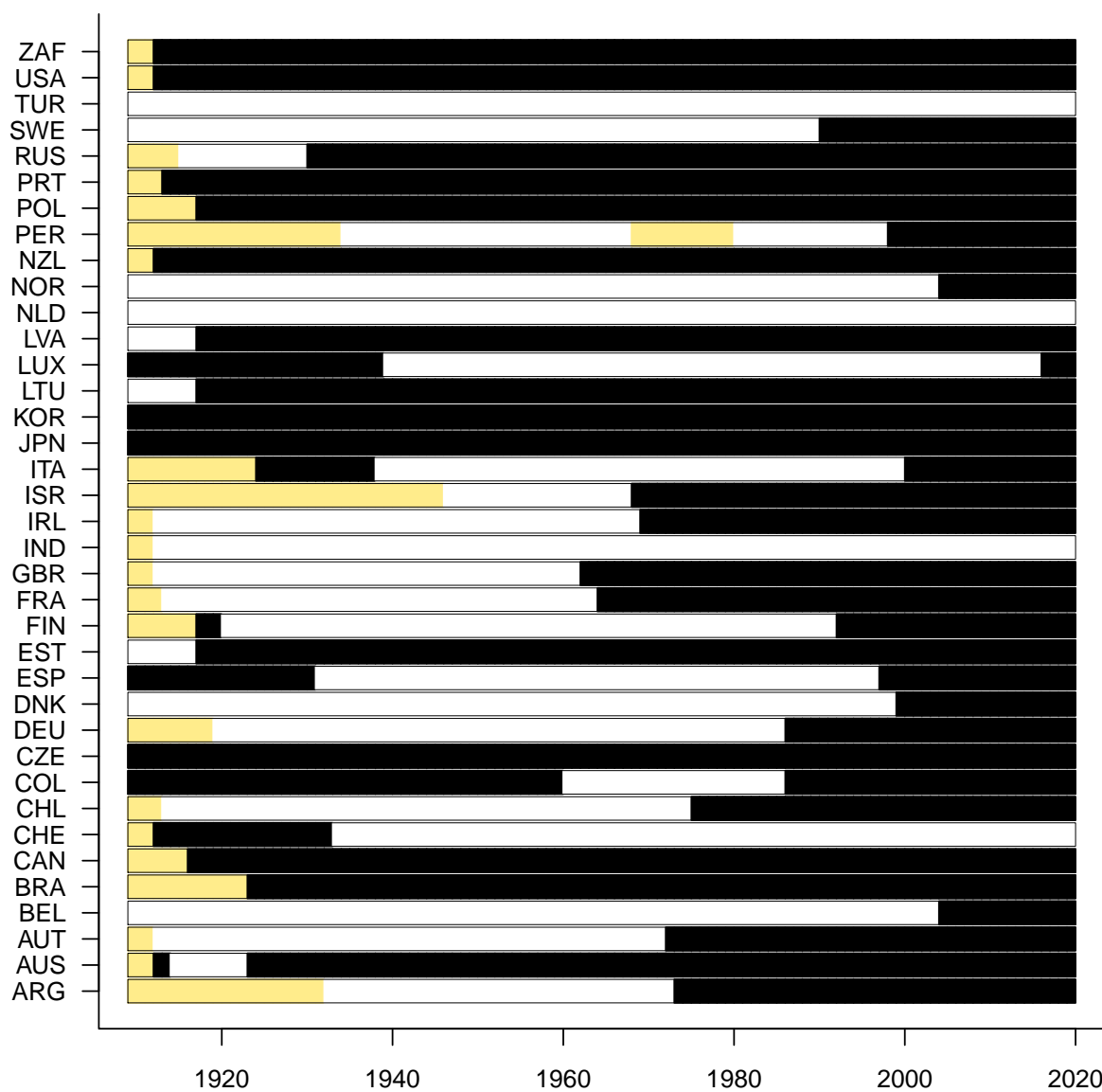
The indices of homeownership tax attractiveness cover 37 countries. Figure 6 shows their geographical distribution in 2020. Again, the shades of grey depict the degree of attractiveness of taxation, while yellow denotes countries for which no such information is available. The composite indices for individual countries are displayed in Figure 5.

In addition, we can measure a degree of neutrality of homeownership taxation with respect to the housing tenure. If the tax treatment is more favorable toward homeowners, then *ceteris paribus* it can create an additional incentive for people making choice between owning and renting a home to become homeowners. The taxation neutrality is defined to be achieved in one of the following two cases: either imputed rent tax is absent and mortgage payments are not deducted or imputed rent tax is levied and mortgage deductions are allowed.

$$TNI_t = \frac{I_t^{\text{imputed rent tax}} + I_t^{\text{mortgage deductibility}} - 1}{2} \quad (3)$$

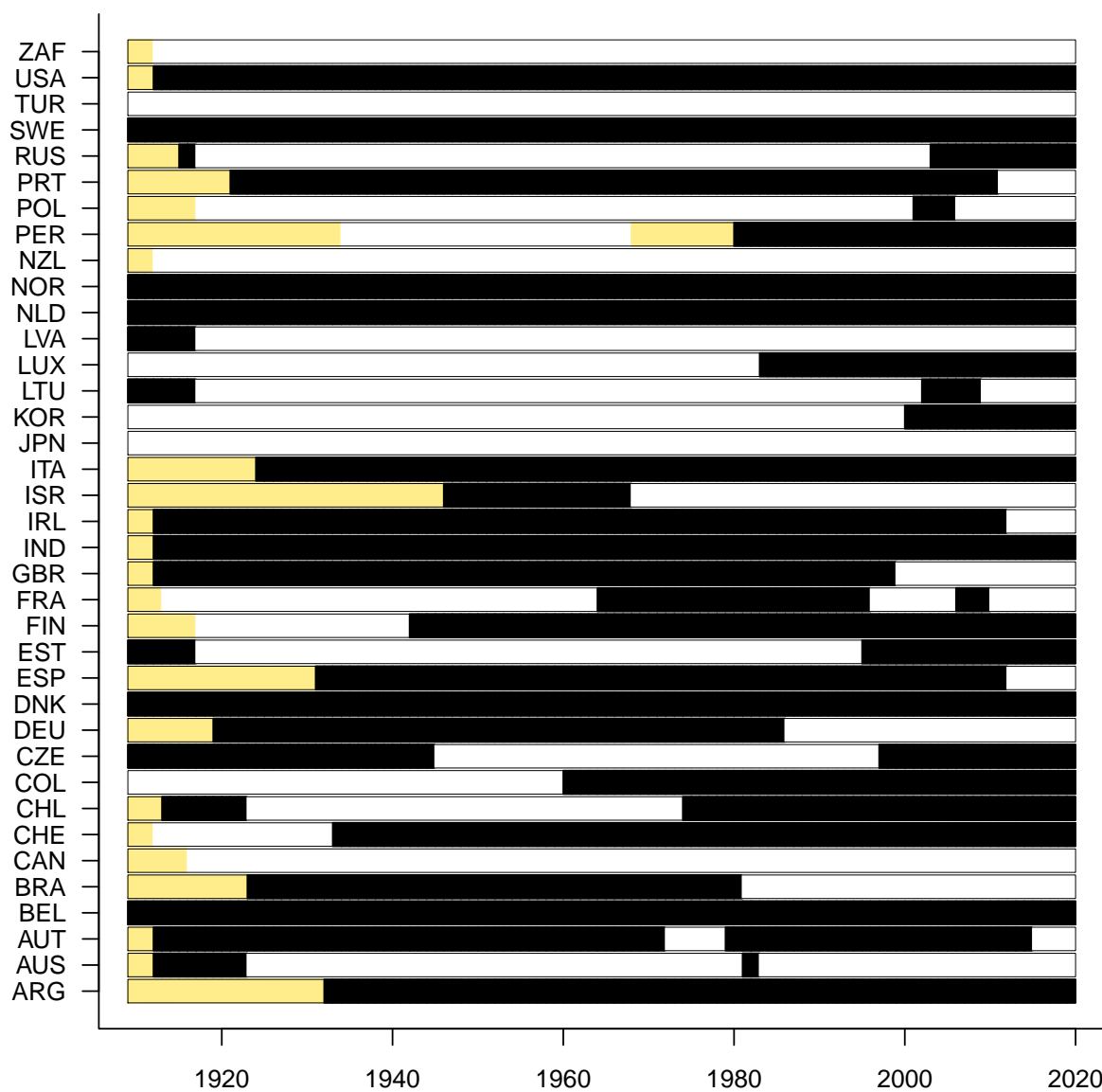
Thus, the value of this index corresponding to the taxation neutrality will be equal 0. When

Figure 1: Tax on imputed rent indices, 1910–2020



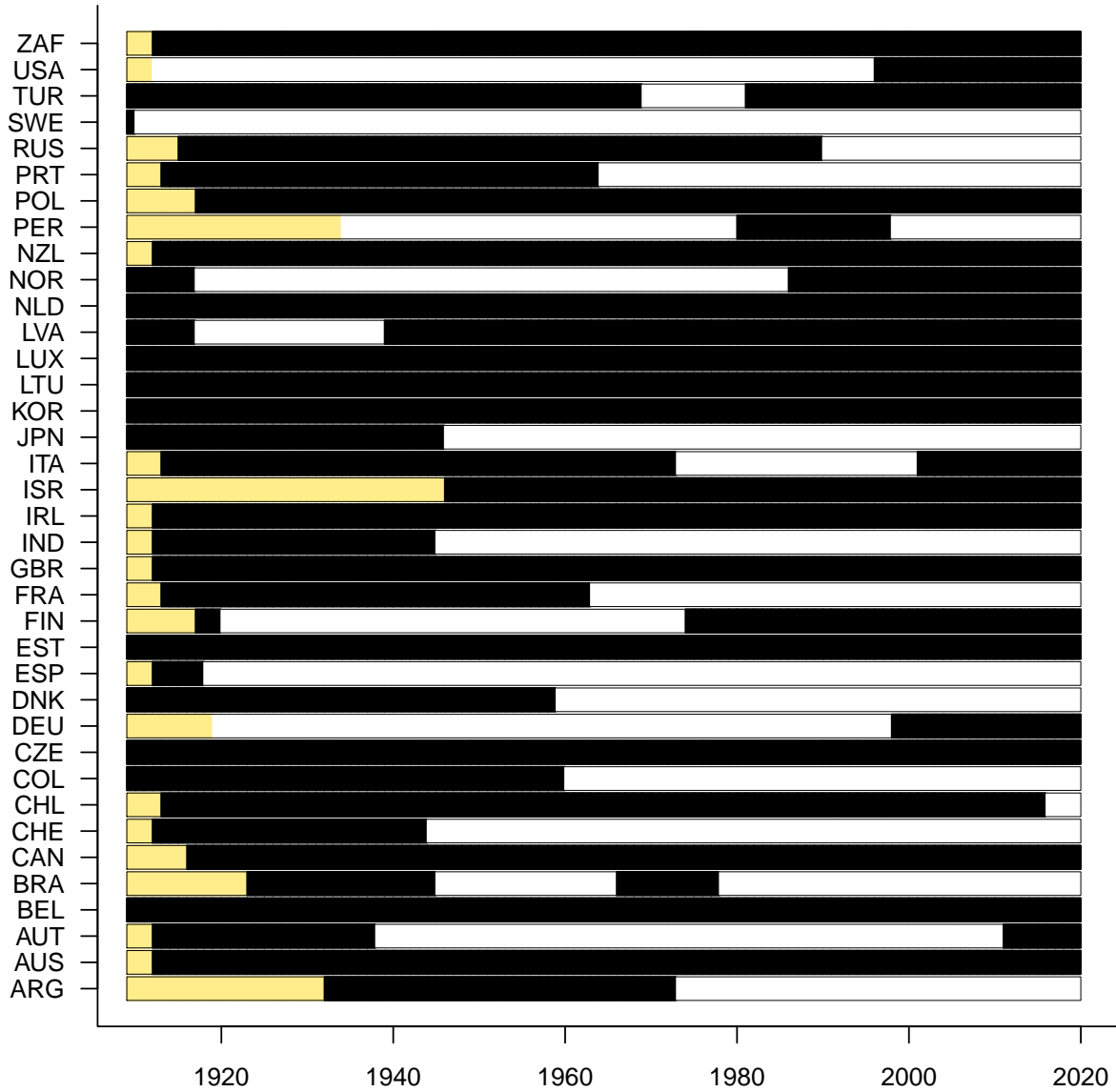
Note: Darker shading stands for more owner-beneficial taxation, yellow shading indicate missing data.

Figure 2: Mortgage deductibility indices, 1910–2020



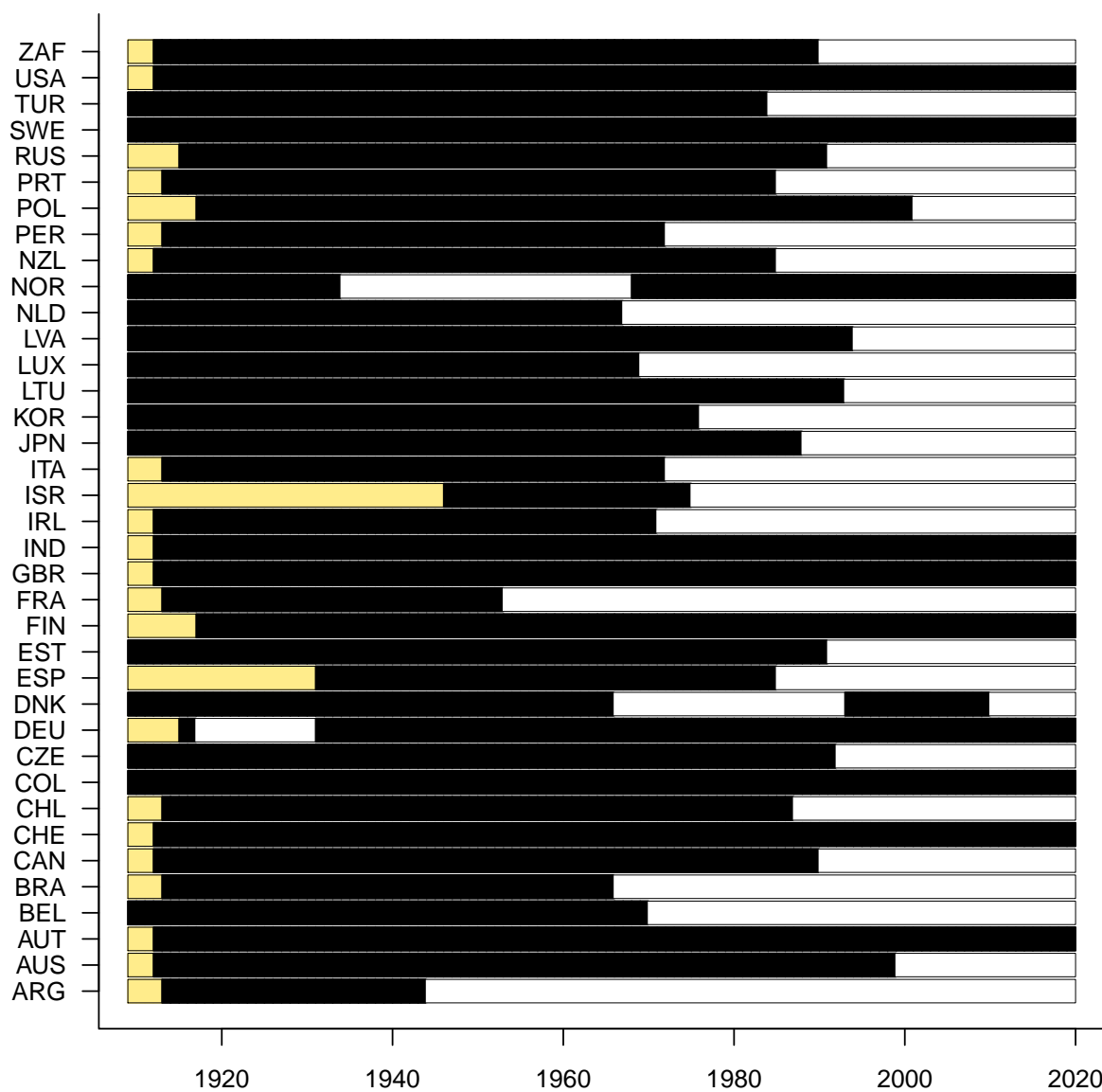
Note: Darker shading stands for more owner-beneficial taxation, yellow shading indicate missing data.

Figure 3: Capital gains tax indices, 1910–2020



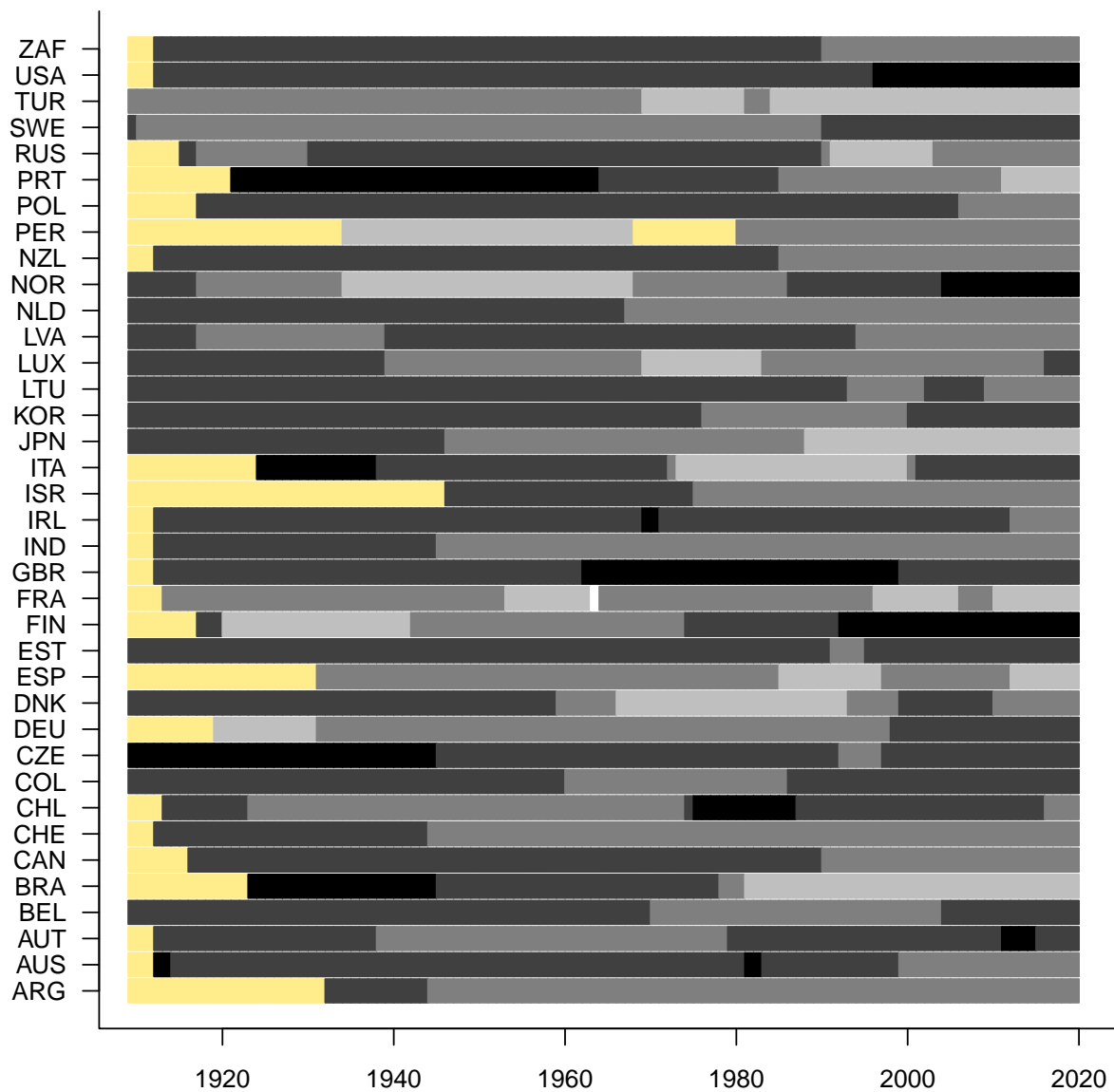
Note: Darker shading stands for more owner-beneficial taxation, yellow shading indicate missing data.

Figure 4: VAT on new housing indices, 1910–2020



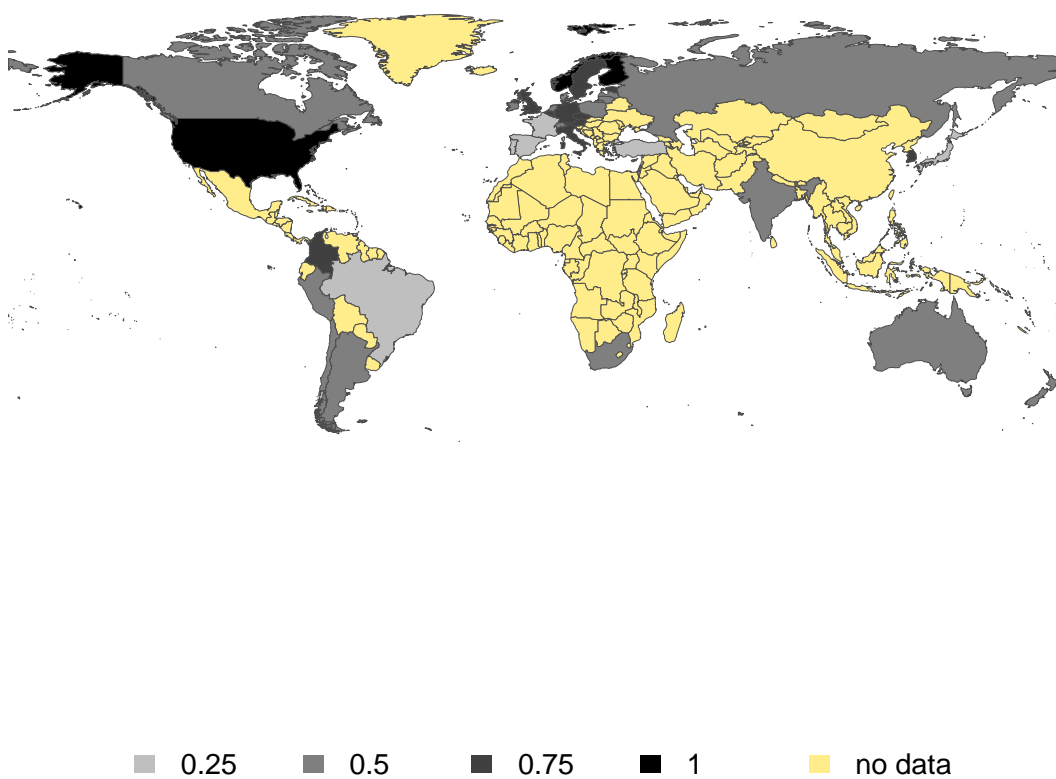
Note: Darker shading stands for more owner-beneficial taxation, yellow shading indicate missing data.

Figure 5: Composite tenure neutrality tax indices, 1910-2020



Note: Darker shading stands for more owner-beneficial taxation, yellow shading indicate missing data.

Figure 6: Map of the composite homeownership tax attractiveness index, 2020



Note: Darker shading stands for more owner-beneficial taxation.

it is below zero, taxation is biased toward renters, while when it is positive, it is biased toward homeowners.

## 5. Results: descriptive and explanatory assessment of homeownership welfare

### 5.1. *Individual tax indices*

We first assess the tax indices descriptively. In many countries, the imputed rent tax existed at earlier stages, but was lifted in the 1960–1970s, as seen in Figure 1. Some countries had never introduced it. Only three countries (Chile, India, and Turkey) have had imputed rent tax throughout the whole observation period. The picture for mortgage deductibility is much more heterogeneous. In fact, countries are divided into three groups: those that had this option over the whole period; those that never had it; those that had it for some period (see Figure 2). In addition, several countries (Australia, Austria, Chile, France, and Russia) eliminated this benefit, but later re-introduced it. In Russia, it was related to a radical change in economic and political system that occurred in 1917 and then in 1991. A similarly heterogeneous picture is observed for the capital gains tax (see Figure 3). Finally, the VAT on new housing appears to be a relatively new development, as Figure 4 shows. In part, it has to do with relative novelty of the value added tax as such. However, even under the predecessor of the VAT — sales tax — exceptions for housing often existed. In most cases, the VAT for the new housing was introduced between 1960 and 2000.

The composite index of homeownership taxation attractiveness as defined in equation (2) is displayed in Figure 5. It shows that the attractiveness varied considerably between 1910 and 2020. Therefore, it is difficult to draw generalized conclusions. In many countries, the tax treatment of homeownership has become less attractive, for example, in Brazil, Japan, and Turkey. Other countries made their taxation more favorable for their homeowners: e.g., Finland and the USA. In fact, the US taxation policy has been always biased toward homeownership, but a particularly strong increase in this bias occurred in the mid-1990s. All in all, the Anglophone countries appear to give more fiscal preference to homeowners. By contrast, in the Scandinavian countries, during the long period under inspection, the taxation has been much less favorable to homeowners. This is, in parts, due to countries like Sweden having followed an explicit tenure neutrality policy (Bengtsson, 2006). In parts, countries have simply used homeownership

subsidies other than fiscal ones. Moreover, since the 1990s, the situation changed in the opposite direction.

Table 1 shows the long-run averages of the four individual indices and of the composite tax neutrality index, which are calculated over the period between 1914 and 2020. It allows comparing the degree of the long-run attractiveness and neutrality of taxation of the owner-occupied housing.

In most Anglophone countries (Australia, Ireland, and United Kingdom, the USA), the long-run average of the attractiveness index is much higher than the long-run average for the whole sample. Portugal belongs to the countries with a very high attractiveness index. Thus, during the past 100 years, these countries have conducted taxation policies that fostered the formation of the homeownership. By contrast, the lowest levels of the composite attractiveness index are observed in the Scandinavian countries (Denmark, Norway, and Sweden). There is a broad correspondence between countries with early, high homeownership and fiscal homeownership support on one hand, and countries with later, lower homeownership and the absence of such support.

The last column of Table 1 reports the long-term averages of the neutrality index as defined in equation (3). It varies between  $-0.5$  in Turkey (biased toward rental tenure) and  $0.5$  in the USA (biased toward homeownership). Only six countries have negative neutrality indices (Chile, France, Luxembourg, Peru, Sweden, and Turkey) pointing out to their rental-biased property taxation over most time. In 10 countries, taxation is neutral in the long run: Canada, Germany, India, Israel, Japan, Latvia, The Netherlands, New Zealand, South Africa, and Switzerland.

## 5.2. Correlation with other regulation indices

The homeownership taxation does not exist in a regulatory vacuum, as governments have a wide range of regulations in place, for example, those concerning finance, labor, and product markets. Many of them are approximated by indices constructed in existing research. The country and year coverage is very different, but we computed correlations between the homeownership tax attractiveness index and each of the 50 other indices that could be found. These indices have various sizes: from 5 to 200 countries and from 1 to 112 years. Among 50 indices, 19 represent cross-sections, while the rest are panel data. Figure 7 displays only the statistically

Table 1: Long-term averages of taxation attractiveness and neutrality indices, 1914–2020

Country	Imputed rent tax	Mortgage deduction	Capital gain tax	VAT new housing	Attractiveness index	Neutrality index
ARG	0.534	1	0.466	0.290	0.534	0.267
AUS	0.917	0.120	1	0.806	0.711	0.019
AUT	0.444	0.889	0.324	1	0.664	0.167
BEL	0.133	1	1	0.583	0.679	0.067
BRA	1	0.598	0.351	0.495	0.598	0.299
CAN	1	0	1	0.722	0.678	0
CHE	0.194	0.806	0.296	1	0.574	0
CHL	0.421	0.523	0.963	0.692	0.650	-0.028
COL	0.783	0.500	0.500	1	0.696	0.142
CZE	1	0.567	1	0.767	0.833	0.283
DEU	0.337	0.663	0.218	0.867	0.525	0
DNK	0.189	1	0.450	0.667	0.577	0.095
ESP	0.405	0.910	0.056	0.607	0.444	0.084
EST	0.858	0.350	1	0.758	0.742	0.104
FIN	0.301	0.757	0.476	1	0.633	0.029
FRA	0.523	0.336	0.467	0.374	0.425	-0.070
GBR	0.537	0.806	1	1	0.836	0.171
IND	0	1	0.306	1	0.576	0
IRL	0.472	0.926	1	0.546	0.736	0.199
ISR	0.703	0.297	1	0.392	0.598	0
ITA	0.354	1	0.738	0.551	0.641	0.177
JPN	1	0	0.383	0.733	0.529	0
KOR	1	0.167	1	0.633	0.700	0.083
LTU	0.858	0.200	1	0.775	0.708	0.029
LUX	0.358	0.308	1	0.575	0.560	-0.167
LVA	0.858	0.142	0.817	0.783	0.650	0
NLD	0	1	1	0.558	0.640	0
NOR	0.144	1	0.378	0.694	0.554	0.072
NZL	1	0	1	0.676	0.669	0
PER	0.297	0.541	0.209	0.551	0.385	-0.081
POL	1	0.049	1	0.816	0.716	0.024
PRT	1	0.909	0.477	0.673	0.747	0.455
RUS	0.857	0.181	0.714	0.724	0.619	0.019
SWE	0.270	1	0.009	1	0.570	0.135
TUR	0	0	0.900	0.700	0.400	-0.500
USA	1	1	0.222	1	0.806	0.500
ZAF	1	0	1	0.722	0.681	0
Average	0.589	0.548	0.676	0.725	0.633	0.067

significant coefficients of correlation between our composite homeownership tax attractiveness index and various indices representing other types of governmental regulations. The correlation coefficients are computed for all available values of each pair of indices. Thus, if both indices have longitudinal structure, the country-specific indices for each mutually available time periods are correlated.

The selected indicators come from various sources and cover different areas of governmental regulations. OECD indicators,<sup>4</sup> concerning the individual/collective dismissals and temporary contracts, measure the strictness of employment protection legislation (EPL). Higher values signify more comprehensive EPL within a country in a certain year. Similarly, Nicoletti et al. (1999) use data from the OECD Employment Outlook 1999 in order to gauge EPL. Botero et al. (2004) examine employment law, industrial/collective relations law, and social security laws in 85 countries for the year 1997. Higher values indicate a higher degree of regulation and, thus, of protection of the employees. The project “Law, Finance and Development” at the Centre for Business Research (CBR) at the University of Cambridge (Armour et al., 2016) built several indicators to measure shareholder, creditor, and worker protection (labor regulation) that take higher values for more protection of the corresponding market participants through legislation. Djankov et al. (2007) also measure creditor protection in 129 countries following the approach of La Porta et al. (1999). Again, higher values of the indices imply stronger protection of the creditor rights. Pistor et al. (2000) use the same approach for several transition economies. Abiad et al. (2008) created an index that measures financial reform, with higher values indicating more liberalization concerning financial laws. Finally, Botero and Ponce (2011) create the Rule of the Law index and Freedom House<sup>5</sup> measures freedom in the world, again higher values for both indices indicating more rule of the law/freedom.

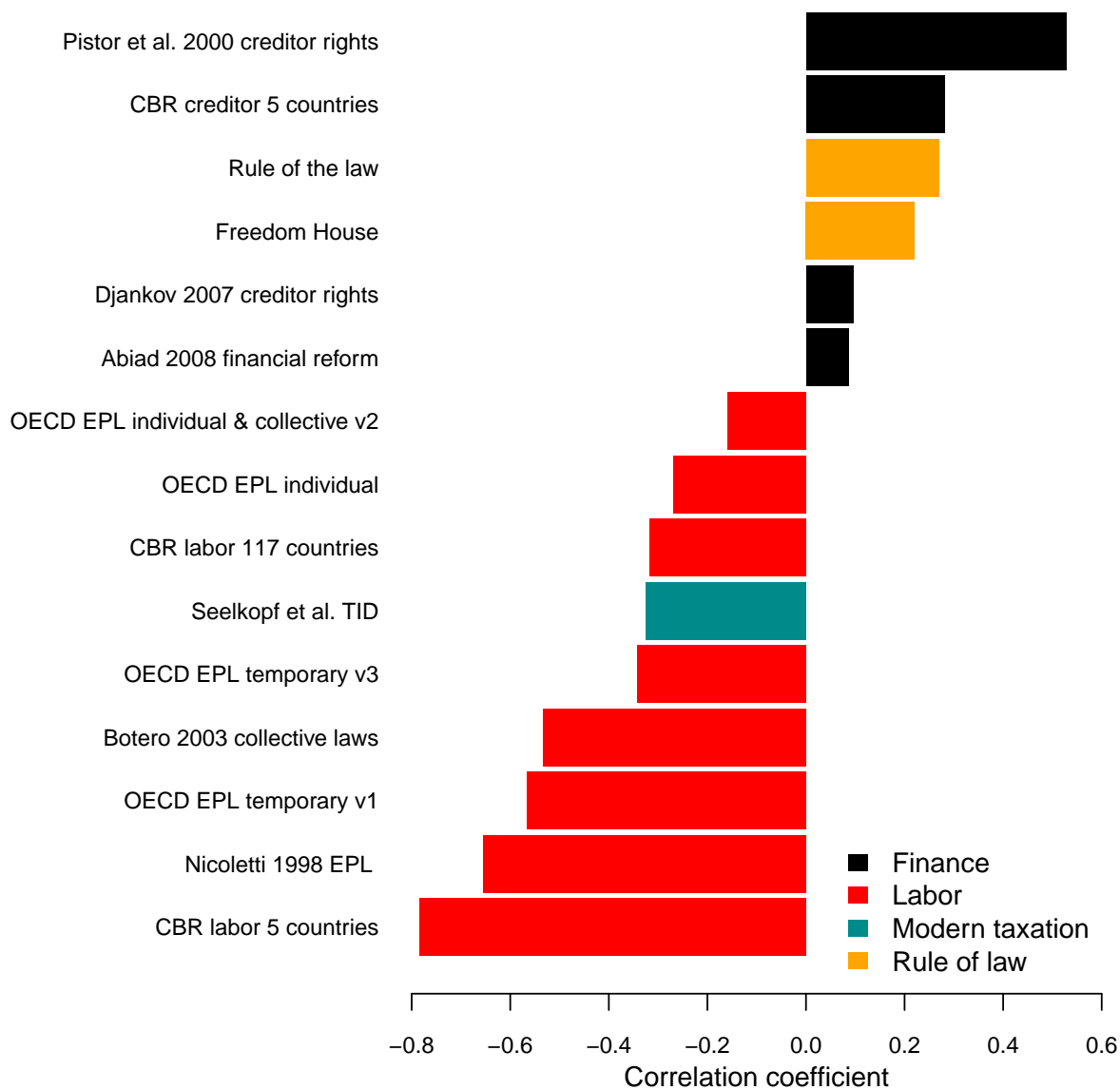
The resulting picture which situates fiscal homeownership support in the regulatory landscape is shown in Figure 7. The strongest correlations are observed between the homeownership taxation index, on the one hand, and financial market, labor market, and rule of law regulations, on the other hand. The correlation is negative and relatively strong for labor market indices. In particular, the correlation is significant with the following indices: CBR labor reg-

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<sup>4</sup>See [https://stats.oecd.org/Index.aspx?DataSetCode=EPL\\_OV](https://stats.oecd.org/Index.aspx?DataSetCode=EPL_OV).

<sup>5</sup>See <https://freedomhouse.org/countries/freedom-world/scores>.

Figure 7: Homeownership tax attractiveness vs. other regulations



Sources: [Abiad et al. \(2008\)](#); [Armour et al. \(2006, 2016\)](#); [Botero and Ponce \(2011\)](#); [Botero et al. \(2004\)](#); [Deakin et al. \(2007\)](#); [Djankov et al. \(2007\)](#); [Freedom House \(2020\)](#); [Howell \(2005\)](#); [Nicoletti et al. \(1999\)](#); [Pistor et al. \(2000\)](#); [Seelkopf et al. \(2021\)](#), and own calculations.

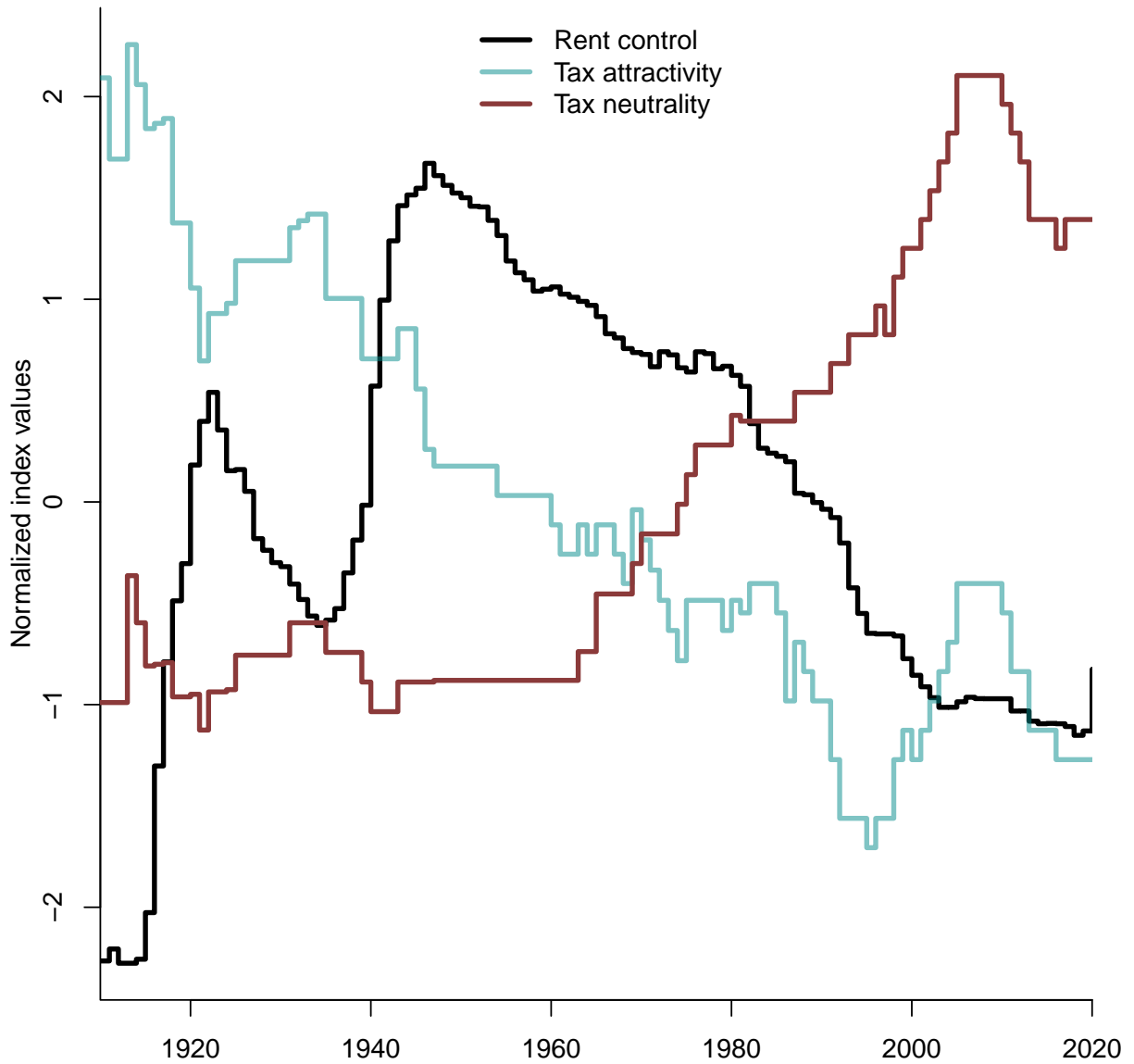
ulation index of [Armour et al. \(2016\)](#); strictness of employment protection legislation of the OECD; employment protection legislation of [Nicoletti et al. \(1999\)](#); and labor regulation of [Botero et al. \(2004\)](#). The correlation is much weaker and positive for financial market indices and for rule-of-law and freedom indices.

Thus, a more generous support of homeownership is accompanied by more liberal financial regulations, stronger creditor protection and weaker regulation of labor. The opposite is also true. The indices broadly capture a certain left-right dimension, where homeownership support is rather associated with regulation situated on the right.

Given that for rental housing market regulations we have indices of [Kholodilin \(2020\)](#) of the same length and that such regulations affect the same object as homeownership taxation indices — housing market and tenure choice — it is instructive to compare these indices. Figure 8 shows the indices of homeownership taxation attractiveness and neutrality as well as rent control. All these indices are computed as simple averages for the 37 countries under inspection (except for South Korea for which no rent control index is available) and then normalized to render the picture more readable.

The relationship between the tax attractiveness and rent control indices varies strongly across time. Until 1920, both indices moved in the same direction: stricter rent controls were accompanied by providing more benefits to homeowners. In the interwar period, the relation changed: a certain retreat of rent controls went hand in hand with more favorable taxation of homeowners. After World War II, the state both lifted rent controls and cut benefits to homeowners. However, from the mid-1990s onward, governments have showed renewed interest in fiscal support for homeowners, while rent controls kept decreasing. In 2020, the emergency measures related to the COVID-19 pandemic led to a spike in rent control regulations. Interestingly, the relationship between the homeownership taxation neutrality and rent control is much more clear cut: over most of the period, they are negatively correlated. Between 1965 and 2009, the aggregate neutrality index was on an upward trend. However, after the Great Recession of 2008–2009, it declined, as a reaction to the burst of the huge speculative bubble in the housing market. Supporting homeowners or tenants has thus stood in a historical trade-off relationship.

Figure 8: Homeownership tax attractiveness index vs. rent control index



Source: [Kholodilin \(2020\)](#) and own representation.

Note: The values of indices are normalized by subtracting averages and dividing by the standard deviation so that the indices have the same scale and become easier to compare. Higher values of indices correspond either to stricter rent control or to more state support of the homeownership.

### 5.3. Regression analysis

After these binary correlations and general trends, we turn to a multivariate analysis of the factors determining the attractiveness and neutrality of the homeownership tax treatment. Following the underlying first expectation that it follows welfare-state logics, we first introduce fundamentals such as log per capita GDP (LGDP\_PC), population (Lpop), state information capacity (infcap\_pca) and the number of taxes (TID) introduced. This broadly corresponds to the expectation that fiscal homeownership welfare is mainly driven by economic or demographic fundamentals and the secular trend towards state and fiscal capacity. The data are retrieved from the Maddison Project Database,<sup>6</sup> the Information Capacity Dataset (Brambor et al., 2020) — an index varying between 0 and 1, where higher values imply a high information capacity<sup>7</sup> — and Seelkopf et al. (2021); see Table 2. To speak to the polity expectation, we introduce a time-invariant legal-origin variable (La Porta et al., 1998), as taxation is closely associated with aspects of countries’ legal systems.

Table 2: Descriptive statistics of explanatory variables

Code	Variable	N	Mean	St. dev.	Min	Q1	Q3	Max
DLGDP_PC	Growth rate of GDP per capita, %	8,901	2.1	6.6	-94.8	0	4.8	100.8
pop	Population, million persons	9,821	37.5	120.7	0.1	3.2	24.4	1,385.4
Rent_laws	Rent control index	13,786	0.5	0.4	0	0	0.8	1
Social2GDP	Social expenditure-to-GDP ratio, %	2,738	10.8	8.8	0	2.1	18.1	31.9
Soc_housing	Share of social housing	2,887	19.8	21.8	-0.8	3.9	25.4	83.1
Left_right	Left-right government	2,730	5.3	0.6	0.4	4.9	5.7	7.4
leftgov	Left government Scheve-Stasavage	4,099	0.4	0.5	0	0	1	1
TID	Tax introduction	13,080	0.5	0.3	0	0.2	0.8	1
infcap_pca	Information capacity	6,337	0.7	0.2	0	0.6	0.7	1

Note: *N* stands for the number of observations; St. dev. denotes standard deviation, Q1 and Q3 stand for the 1st and 3rd quartiles, respectively.

While this general specification allows including the full sample, we introduce three additional variables in a second model following our theoretical expectations. This restricts the

<sup>6</sup>See <https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020>.

<sup>7</sup>The aggregate indices used in our regressions are based on the data on several institutions and policies that modern states use to collect information about their populations and territories: 1) the regular implementation of a reliable census, 2) the regular release of statistical yearbooks, the operation of 3) civil registers, 4) population registers, and 5) the establishment of a government agency tasked with processing statistical information. The indices cover 85 countries over the period 1750–2015.

sample to advanced capitalist democracies, but we can check whether the left-right orientation of the government, the social expenditure to GDP, and rental market regulation are associated with homeownership attractiveness. This is to test whether homeownership policies follow a partisan, welfare, or housing-regulation logic. The *Left\_right* index — ranging from 0 (very left) to 10 (very right) — is computed as the average of a cabinet right/left index weighted by the share of elections seats based on the country-specific index from the ParlGov database (Döring and Manow, 2020). Welfare expenditure are from the OECD<sup>8</sup> and rental housing market regulation indices are from Kholodilin (2020).

We estimate the following random-effects panel data model:

$$y_{it} = \mu + \sum_{k=1}^K \beta_k x_{i,t-1}^k + u_i + \varepsilon_{it} \quad (4)$$

where  $y_{it}$  is a homeownership tax treatment index (individual index, attractiveness or neutrality) in country  $i$  in year  $t$ ;  $\mu$  is the intercept;  $x_{it}^k$  is an explanatory variable  $k$ ;  $u_i$  are the country random effects; and  $\varepsilon_{it}$  is the random disturbance. We opt for the random-effects model using the method of Wallace and Hussain (1969) because we use the variable of legal origin, which is time invariant. In order to avoid imprecise estimates when applying fixed-effects models to the cases where the key variables do not vary over time, the researchers must use the random-effects estimator (Wooldridge, 2010, p. 326). The potential endogeneity problem (e.g., homeownership taxation and rent control can be driven by common factors) is dealt with by using the lags of the explanatory variables. Moreover, the use of lags allows accounting for the lengthy process the policymakers and legislators need to go through before the policies reacting to some shock will be adopted (Blanchard and Perotti, 2002, p. 1334).

We use OLS to estimate all models and report robust standard errors. In case of the four binary indices, we have discrete-choice models. These models can be estimated using binary regression, including both logit/probit or linear probability model (PLM). The latter linearly regresses a binary dependent variable on the explanatory variables (Wooldridge, 2015, p. 248 ff). The PLM is both computationally much easier to estimate and more stable than the panel

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<sup>8</sup>OECD Social Expenditure Database (SOCX): <https://www.oecd.org/social/expenditure.htm>.

logit or probit models with random effects.<sup>9</sup>

The estimation results of the two models are reported in Tables 3 and 4. The difference between the models lies in the number of control variables: while in the first group of models fewer variables but more time periods are used, in the second group of models many variables and less time periods are used. The models in Table 3 include data on 36 countries<sup>10</sup> with periods ranging from 40 to 119 years. The models in Table 4 cover 18 countries<sup>11</sup> over the periods varying between 32 and 116 years.

The coefficients of fundamental variables generally point in the unexpected directions, but at low significance levels: the association with GDP is mostly negative, suggesting that homeownership support through fiscal exemption follows more a stimulus than a luxury-tax-gift logic. Small states tend to make more use of fiscal homeownership measures than population-rich ones. Information capacity tends to increase the likelihood of using taxes for homeownership support, while a higher number of taxes rather lowers the likelihood of supporting homeowners fiscally. The strongest and most persistently significant effects are related to countries' legal origin: relative to the common-law countries, all other jurisdictions show less fiscal homeownership support, with Scandinavian countries being the least supportive, French and German jurisdictions in between. For instance, being a Scandinavian country reduces the probability of not charging a tax on imputed rent or a capital gain tax by roughly 75–80%. The countries with German legal origin are likewise less likely to free their homeowners from the tax on imputed rent by about 30% and from capital gain tax by slightly more than 50%. With respect to the English legal origin all other legal origins provide by 10–20% less attractive taxation treatment to the homeowners.

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<sup>9</sup>The complexity of such models sometimes precludes their estimation due to convergence problems. In the programming language **R**, there are two packages allowing to estimate panel discrete-choice models with random effects: *pglm* and *glmmML*. The former does not supply robust standard errors, while the latter theoretically bootstraps standard errors, but in our case does not converge for all binary variables: in particular, for the VAT. Nevertheless, we report estimation results obtained for the models estimated using the *pglm* package in Tables A4 and A5 in Appendix A.

<sup>10</sup>Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Czechia, Denmark, Estonia, Finland, France, Germany, India, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Russian Federation, South Africa, Spain, Sweden, Switzerland, Turkey, UK, and the USA.

<sup>11</sup>Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the UK.

Table 3: Estimation results of random-effects panel data models: fewer variables more observations

Control variable	Dependent variable:					
	Tax on imputed rent	Mortgage deduction	Capital gain tax	VAT	Attractiveness index	Neutrality index
Intercept	1.263 (1.073)	-1.255 (1.461)	2.876** (0.914)	3.098*** (0.818)	1.450*** (0.393)	-0.470 (0.784)
LGDP_PC_lag1	0.246*** (0.065)	-0.069 (0.061)	-0.055 (0.080)	-0.236*** (0.070)	-0.024 (0.039)	0.098** (0.038)
Lpop_lag1	-0.112 (0.117)	0.188 (0.156)	-0.191 (0.102)	-0.178 (0.093)	-0.070 (0.045)	0.033 (0.084)
Legal_originFrench	-0.299 (0.164)	0.266 (0.178)	-0.286** (0.109)	-0.305 (0.163)	-0.161** (0.061)	-0.024 (0.079)
Legal_originGerman	-0.284 (0.255)	0.137 (0.311)	-0.517*** (0.135)	0.198 (0.165)	-0.116* (0.058)	-0.075 (0.065)
Legal_originScandinavian	-0.753*** (0.210)	0.783** (0.284)	-0.787*** (0.195)	-0.117 (0.225)	-0.214* (0.088)	0.006 (0.140)
Adj. R <sup>2</sup>	0.180	0.028	0.101	0.348	0.072	0.142
Num. obs.	3042	3012	3062	3101	3012	3012

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

The second group of models presented in Table 4 zooms in on advanced democracies and allows introducing the partisan, welfare- and housing-regulation variables. While the fundamental and polity effects from above are largely confirmed, the new partisan variable is hardly statistically significant throughout specifications. If at all, there is a light leaning of right governments against fiscal homeownership welfare. There is a weak negative relationship between homeownership support and rent regulation, whereas the relationship between social expenditure and homeownership support is, if at all, positive and thus not suggesting a hard trade-off between welfare and homeownership.

Table 4: Estimation results of random-effects panel data models: more variables fewer years

Control variable	Dependent variable:					
	Tax on imputed rent	Mortgage deduction	Capital gain tax	VAT	Attractiveness index	Neutrality index
Intercept	3.125** (1.069)	0.645 (1.394)	0.043 (1.186)	2.392** (0.794)	1.511*** (0.376)	1.131* (0.564)
LGDP_PC_lag1	0.112 (0.107)	0.039 (0.091)	0.103 (0.120)	0.146 (0.110)	0.100 (0.065)	0.066 (0.052)
Lpop_lag1	-0.311** (0.120)	-0.152 (0.139)	0.032 (0.107)	-0.141* (0.062)	-0.137*** (0.039)	-0.201*** (0.055)
Rent_laws_lag1	-0.227** (0.088)	0.115 (0.085)	-0.054 (0.078)	0.226* (0.088)	0.016 (0.036)	-0.055 (0.042)
Social2GDP_interp_lag1	0.016* (0.008)	-0.004 (0.006)	-0.013 (0.010)	-0.016 (0.010)	-0.004 (0.004)	0.006 (0.004)
Left_right_lag1	-0.017 (0.046)	0.139 (0.075)	0.010 (0.070)	-0.060 (0.073)	0.017 (0.032)	0.060* (0.028)
TID_lag1	0.111 (0.262)	0.452 (0.300)	-0.404 (0.340)	-0.871** (0.318)	-0.204 (0.192)	0.263 (0.171)
infcap_pca_lag1	0.432 (0.415)	-0.319 (0.310)	1.061 (0.771)	0.574 (0.515)	0.442 (0.321)	0.069 (0.233)
Legal_originFrench	-0.417 (0.218)	0.635* (0.279)	-0.362 (0.185)	-0.241 (0.180)	-0.100 (0.124)	0.088 (0.172)
Legal_originGerman	-0.267 (0.337)	0.558 (0.296)	-0.874*** (0.150)	0.150 (0.209)	-0.114 (0.138)	0.124 (0.173)
Legal_originScandinavian	-1.021*** (0.155)	0.644* (0.256)	-0.673*** (0.182)	-0.143 (0.169)	-0.294* (0.121)	-0.162 (0.150)
Adj. R <sup>2</sup>	0.414	0.073	0.105	0.316	0.121	0.316
Num. obs.	1670	1670	1670	1674	1670	1670

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

The above findings are robust under different specifications (presented in Appendix A). In particular, we considered the models with both country and time random effects, used alternative measures of social expenses (such as proportion of the social housing stock) and of the political position of the executive (such as the extended left government index of [Scheve and Stasavage 2009](#)); see Tables [A1](#), [A2](#), and [A3](#).

## 6. Discussion and conclusion

The welfare state has mostly been described through the lens of the visible social-security system with its focus on labor and income-maintenance. This is certainly the largest part of government welfare spending, readily available in numerous measurements and at the core of party politics. Welfare states have not only created their constituencies but also a paper industry of scholarly work devoted to understanding their rise and variations over time and countries. This has led to an established set of theoretical expectations and well-known typologies.

In the shadow of this classical welfare state and with the rise of modern tax systems, however, welfare by other means and, in particular, by fiscal exemptions has gained momentum, not least because classical welfare has come under attack in very visible politics ([Pollard, 2011](#)). Fiscal expenditure, by contrast, with its technicalities and measurement difficulties has long remained below the radar of politics and welfare research. This is where this paper makes a first contribution by zooming in on one of its major items: homeownership welfare.

The descriptive analysis reveals that fiscal homeownership attractiveness has become less widespread until the 1980s, but has grown ever since, whereas the tax system had become biased in favor of homeowners already by the 1980s. Fiscal support for homeowners is closely tied to financial market liberalization and rather comes at the cost of labor market regulation. In the regulatory landscape, it rather pertains to the center-right. But how does it compare with the social-security welfare state? Our multi-variate analysis reveals that homeownership welfare is not in a simple trade-off relationship with traditional social expenditures.

Moreover, we find that the explanatory expectations from welfare research are almost completely reversed when carried over to fiscal homeownership welfare. First, the logic of industrialism, if identified at all, is reversed. Homeownership welfare is not necessarily bought as a luxury by higher GDP levels, but rather follows a tax stimulus logic, countercyclical with

the business cycle. Second, partisan hypotheses are hardly significant: it is not the case that left governments are the architects behind homeownership welfare, but, third, polity effects are the most crucial in understanding the presence or not of fiscal homeownership support: how tax systems and their exemptions are set up is, perhaps unsurprisingly, very much dependent on a countries' general legal structure. Contrary to the situation with traditional welfare, Anglophone countries are the most comprehensive homeownership welfare states, whereas the universal welfare states of Scandinavia have the least comprehensive fiscal homeownership welfare. The explanatory logics for traditional welfare thus do not easily travel to understanding fiscal homeownership welfare.

This may have to do with the extent to which this kind of welfare is tied to the tax system and the use made of it. It is also different from traditional welfare as it often targets people who are already paying taxes and aspire to property, which then are rather the haves and not the have-nots in a society. As tax progressivity can be turned around, these subsidies can have regressive redistribution effects and are rather part of middle-class politics. This might explain why no strong left-wing partisan effect can be found.

The existence or not of fiscal exemptions for homeowners is obviously only a first step in shedding light on the hidden welfare state. There are not only direct transfers to homeowners, which still have to be measured across countries and time. There is also no assessment of how large the fiscal exemptions actually are. We know from previous work on individual countries such as France or the US that they have only kept growing over time ([Pollard, 2011](#); [Howard, 1999](#)). Moreover, the OECD has recently tried to quantify different fiscal measures favoring homeownership for selected countries in 2018, and the numbers range from below 1% to more than 1% of GDP in Anglophone and some Scandinavian countries ([OECD, 2020](#)). Cursory country evidence suggests that mortgage interest rate deductions are among the largest budget items for homeowners and even if a country does not tax imputed rents, it might still bear a large homeownership welfare state in absolute terms. This and the non-fiscal transfers might help to understand why some high-homeownership countries are not associated with a high fiscal attractiveness index. The index itself proxies the comprehensiveness of fiscal homeownership measures, but further research would need to pin down how much fiscal income is lost by states through every type of fiscal exemption.

In future research, these indices can also be used to assess the impact of ownership taxation policies on housing market consequences starting with homeownership rates themselves, but including also macroeconomic outcomes such as the growth of mortgage indebtedness or the risk of house price inflation. Welfare by fiscal expenditure also concerns other areas, than the housing market. They also include farm or business owners, commuters, household with children, etc. They all have in common that they only concern entities, which can be taxed, and are thus rather a relief for property owners, than the have-nots addressed by poverty welfare, for instance. Given the often invisible politics around these indirect budget items, this study also lays some groundwork for contributing to fiscal transparency modern democracies should strive for.

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## Appendix A: Robustness tests

Table A1: Robustness test: panel data model with random two-ways effect

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	3.121 (1.798)	0.645 (1.246)	0.050 (0.830)	2.362** (0.744)	1.492*** (0.447)	1.111 (0.713)
LGDP_PC_lag1	0.111 (0.308)	0.039 (0.125)	0.103 (0.109)	0.144 (0.127)	0.099 (0.095)	0.066 (0.108)
Lpop_lag1	-0.310** (0.111)	-0.152 (0.110)	0.031 (0.055)	-0.138* (0.067)	-0.134** (0.050)	-0.199** (0.070)
Rent_laws_lag1	-0.227* (0.109)	0.115 (0.163)	-0.054 (0.081)	0.225** (0.077)	0.016 (0.040)	-0.055 (0.073)
Social2GDP_interp_lag1	0.016 (0.019)	-0.004 (0.012)	-0.013 (0.009)	-0.016 (0.012)	-0.004 (0.006)	0.006 (0.008)
Left_right_lag1	-0.017 (0.122)	0.139 (0.104)	0.010 (0.079)	-0.060 (0.077)	0.017 (0.044)	0.060 (0.047)
TID_lag1	0.110 (0.425)	0.452 (0.452)	-0.404 (0.307)	-0.872** (0.319)	-0.204 (0.174)	0.262 (0.247)
infcap_pca_lag1	0.432 (1.075)	-0.319 (0.439)	1.061 (0.755)	0.576 (0.441)	0.443 (0.300)	0.070 (0.342)
Legal_originFrench	-0.417 (0.262)	0.635* (0.271)	-0.361* (0.169)	-0.244 (0.176)	-0.101 (0.127)	0.086 (0.163)
Legal_originGerman	-0.268 (0.364)	0.558 (0.287)	-0.874*** (0.140)	0.147 (0.197)	-0.116 (0.142)	0.122 (0.180)
Legal_originScandinavian	-1.021*** (0.227)	0.644* (0.260)	-0.674*** (0.182)	-0.140 (0.179)	-0.292* (0.127)	-0.160 (0.182)
Adj. R <sup>2</sup>	0.241	0.311	0.421	0.343	0.158	0.108
Num. obs.	1670	1670	1670	1674	1670	1670

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

Table A2: Robustness test: share of social housing stock in the total housing stock

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	3.888** (1.423)	-2.660* (1.184)	3.101 (1.650)	3.686** (1.149)	2.237*** (0.400)	0.600 (0.424)
LGDP_PC_lag1	0.220 (0.137)	-0.197** (0.072)	0.159 (0.155)	0.029 (0.129)	0.059 (0.082)	0.025 (0.060)
Lpop_lag1	-0.384** (0.143)	0.213* (0.102)	-0.240 (0.150)	-0.191 (0.111)	-0.175*** (0.047)	-0.136** (0.043)
Rent_laws_lag1	-0.353* (0.161)	0.088 (0.091)	-0.003 (0.110)	0.215* (0.107)	-0.012 (0.064)	-0.131 (0.072)
Soc_housing_interp_lag1	0.014 (0.011)	0.010 (0.007)	-0.013 (0.013)	0.004 (0.009)	0.004 (0.005)	0.012* (0.005)
Left_right_lag1	-0.036 (0.060)	0.190* (0.077)	-0.011 (0.078)	-0.116 (0.090)	0.007 (0.039)	0.077** (0.025)
TID_lag1	-0.149 (0.577)	0.423 (0.457)	-0.791 (0.524)	-0.842 (0.505)	-0.338 (0.217)	0.142 (0.111)
infcap_pca_lag1	0.758 (0.542)	-0.245 (0.332)	0.928 (0.685)	0.253 (0.566)	0.413 (0.317)	0.233 (0.185)
Legal_originFrench	-0.504 (0.301)	0.688*** (0.197)	-0.532 (0.307)	-0.563*** (0.165)	-0.234* (0.118)	0.079 (0.144)
Legal_originGerman	-0.378 (0.360)	0.367 (0.348)	-0.875*** (0.239)	-0.041 (0.166)	-0.231 (0.134)	-0.004 (0.074)
Legal_originScandinavian	-1.277*** (0.200)	1.131*** (0.172)	-1.106*** (0.335)	-0.408* (0.185)	-0.453*** (0.103)	-0.151* (0.066)
Adj. R <sup>2</sup>	0.397	0.165	0.165	0.178	0.127	0.327
Num. obs.	1210	1210	1210	1210	1210	1210

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

Table A3: Robustness test: left government

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	2.710*	1.011	−0.051	1.821*	1.203*	1.227*
	(1.085)	(1.090)	(1.533)	(0.752)	(0.519)	(0.609)
LGDP_PC_lag1	0.014	−0.017	−0.084	0.051	−0.005	−0.000
	(0.087)	(0.056)	(0.163)	(0.106)	(0.077)	(0.043)
Lpop_lag1	−0.256*	−0.070	0.108	−0.081	−0.058	−0.152*
	(0.108)	(0.128)	(0.128)	(0.067)	(0.048)	(0.062)
Rent_laws_lag1	−0.238**	0.069	−0.078	0.240**	0.004	−0.079*
	(0.085)	(0.062)	(0.082)	(0.081)	(0.038)	(0.040)
Social2GDP_interp_lag1	0.018*	−0.001	0.007	−0.011	0.003	0.008*
	(0.007)	(0.003)	(0.014)	(0.009)	(0.006)	(0.004)
leftgov_lag1	−0.022	−0.011	0.012	0.006	−0.001	−0.013
	(0.030)	(0.024)	(0.022)	(0.037)	(0.016)	(0.018)
TID_lag1	0.043	0.271	−0.856*	−0.888**	−0.372	0.199
	(0.293)	(0.264)	(0.358)	(0.289)	(0.213)	(0.181)
infcap_pca_lag1	0.814*	−0.110	0.876	0.476	0.515	0.337
	(0.401)	(0.306)	(0.882)	(0.522)	(0.366)	(0.253)
Legal_originFrench	−0.486*	0.458	−0.145	−0.295*	−0.123	−0.030
	(0.216)	(0.255)	(0.314)	(0.135)	(0.087)	(0.201)
Legal_originGerman	−0.455	0.235	−0.628*	0.059	−0.196*	−0.111
	(0.326)	(0.286)	(0.261)	(0.156)	(0.085)	(0.199)
Legal_originScandinavian	−1.165***	0.417	−0.410	−0.126	−0.296**	−0.359
	(0.214)	(0.286)	(0.373)	(0.145)	(0.101)	(0.190)
Adj. R <sup>2</sup>	0.329	0.027	0.135	0.352	0.127	0.252
Num. obs.	1930	1902	1940	1929	1902	1902

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

Table A4: Panel logit model with random country effects: few variables and many observations

Control variable	Dependent variable:			
	Tax on imputed rent	Mortgage deduction	Capital gain tax	VAT
Intercept	0.727 (0.642)	−4.133*** (0.547)	16.539*** (1.044)	12.125*** (0.689)
LGDP_PC_lag1	2.399*** (0.120)	−0.036 (0.073)	−0.649*** (0.060)	−3.187*** (0.133)
Lpop_lag1	−0.381*** (0.074)	0.481*** (0.050)	−1.092*** (0.074)	−0.627*** (0.060)
Legal_originFrench	−3.450*** (0.229)	0.716*** (0.193)	−2.633*** (0.284)	−1.760*** (0.163)
Legal_originGerman	−3.139*** (0.232)	−1.259*** (0.248)	−6.668*** (0.436)	2.164*** (0.304)
Legal_originScandinavian	−6.154*** (0.310)	4.257*** (0.330)	−6.938*** (0.494)	−1.311*** (0.269)
sigma	4.134*** (0.200)	3.909*** (0.209)	3.653*** (0.208)	4.075*** (0.206)
Log-likelihood	−894.716	−862.607	−1065.977	−866.060
Number of observations	3101	3101	3101	3101

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

Table A5: Panel logit model with random country effects: many variables and fewer observations

Control variable	Dependent variable:			
	Tax on imputed rent	Mortgage deduction	Capital gain tax	VAT
Intercept	5.438 (3.142)	4.024 (2.517)	31.490 (607.242)	39.961*** (3.448)
LGDP_PC_lag1	0.985* (0.478)	0.525 (0.479)	1.327*** (0.341)	3.060*** (0.470)
Lpop_lag1	0.422* (0.178)	−1.869*** (0.188)	−1.361*** (0.247)	−2.867*** (0.283)
Rent_laws_lag1	−3.439*** (0.590)	2.013*** (0.448)	−0.370 (0.332)	4.286*** (0.551)
Left_right_lag1	0.175 (0.291)	1.220*** (0.244)	0.641** (0.200)	−0.171 (0.286)
Social2GDP_interp_lag1	0.518*** (0.057)	−0.038 (0.040)	−0.143*** (0.030)	−0.027 (0.036)
TID_lag1	−5.064** (1.930)	5.194*** (1.108)	−6.367*** (0.966)	−30.620*** (2.373)
infcap_pca_lag1	4.648* (2.066)	−3.815* (1.658)	14.118*** (1.586)	9.004*** (1.687)
Legal_originFrench	−10.705*** (0.857)	8.601*** (0.738)	−25.601 (607.231)	0.721 (0.497)
Legal_originGerman	−7.258*** (0.713)	6.477*** (0.576)	−31.947 (607.233)	−1.128 (0.685)
Legal_originScandinavian	−11.482*** (1.108)	5.646*** (0.725)	−33.604 (607.234)	−4.293*** (0.665)
sigma	9.219*** (0.836)	4.372*** (0.331)	6.030*** (0.697)	3.787*** (0.303)
Log-likelihood	−266.359	−324.879	−393.409	−354.666
Number of observations	1674	1674	1674	1674

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

## Appendix B: An overview of the evolution of the country-specific homeownership tax treatment

In this Appendix, we document the historical development of homeownership taxation in individual countries. We do this in the form of concise comments upon the relevant legal acts.<sup>12</sup>

### *Argentina*

An imputed rent tax for owner-occupied dwellings was provided for by the *Ley 11.682 regimen sobre impuesto a los réditos* of January 4, 1933. It was based on the fiscal valuation (*valuación fiscal*) of the dwelling. Cheaper dwellings were exempted from this tax. Since the introduction of the *Ley 20.628 sobre impuesto a las ganancias* of December 29, 1973, it does not exist anymore. However, if one possesses a second dwelling, it is subject to the imputed rent tax. The capital gains tax for owner-occupied dwellings has never existed.<sup>13</sup> The possibility to deduct mortgage payments from income taxes was first provided for in the *Ley 11.682 Regimen sobre impuesto a los réditos*, which allowed to subtract the annual amount of mortgage interests from the tax basis. Later, it was modified by the *Ley 20.628 sobre impuesto a las ganancias*, which permits reducing the income tax by a certain amount. This amount is adjusted on a regular basis by the legislators in order to account for inflation. The VAT on newly built housing is levied at least since its origins in Argentina by the *Ley 20.631 Impuesto al valor agregado* of December 29, 1974. However, prior to its origins, it can be traced to the indirect tax that was introduced by the *Ley 12.143 Impuesto a las ventas* of January 10, 1935. Nevertheless, it is only the *Decreto 24.671/45* of October 10, 1945 that extended the tax to the real estate.

### *Australia*

In 1915, the first income tax was introduced in Australia (*Income Tax Act 1915*). Imputed rent was subject to income taxation for 8 years until 1923. *The Income Tax Assessment Act 1915* defined 5% of the capital value of a residential home as taxable income which was offset by any interest paid on mortgage for that residence therefore allowing mortgage interest deduction

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<sup>12</sup>A complete list of these legal acts can be accessed online in the *Longitudinal database of homeownership taxation: Documentation* [https://rpubs.com/Konstantin\\_Xo/HOTI](https://rpubs.com/Konstantin_Xo/HOTI).

<sup>13</sup>Both the Ley 11.682 and the ley 20.628 covered only periodic incomes, but not the windfall gains. It is only with the advent of the *Ley 27.430 Reforma tributaria* of December 28, 2017 that capital gains become subject to the income tax. However, the owner-occupied housing remains exempted from it.

for a relatively short time. *The Income Tax Act 1923* abolished these measures and the taxation policy regarding imputed rent and interest deduction remained like that until now. Capital gains taxation emerged in 1985 (*Income Tax Assessment Amendment (Capital Gains) Act 1986*) but gains from the sale of an owner occupied property were secured under the principal residence exemption which remained in place until now. The sale of new residential properties is taxed since 2000 under the *New Tax System (Goods and Services Tax) Act 1999*. But it does not apply to the re-sale of these properties.

### *Austria*

The income tax act from 1896 (*Gesetz betreffend der direkten Personalsteuern*) already included taxation of imputed rent and allowed interest deduction. In 1973, taxation of imputed rent expired along with mortgage interest deductibility (Merz, 1977). Interestingly, mortgage interest deductibility was reintroduced in 1979 (*Änderung des Einkommensteuergesetzes 1972, des Umsatzsteuergesetzes 1972 und des Familienlastenausgleichsgesetzes 1967*) but came to an end in 2015 (*Steuerreformgesetz 2015/16*). For a long time, capital gains were only subject to taxation if they derived from speculative transactions, which normally is not the case for owner occupied housing. This changed in 1939, when the Austrian tax legislation was adjusted to the German legislation, which imposed a capital gains tax on the sale of real estate within two years. In 2012, the Austrian government introduced a law (*1. Stabilitätsgesetz 2012*) that made an exemption for owner occupied housing. The Austrian sales tax (*Umsatzsteuer*) does not apply to real property as long as real property transfer tax (*Grunderwerbssteuer*) is paid.

### *Belgium*

The tax on imputed rent existed as part of the personal income tax based on rental value of one's property existed since the 19th century. In 1919, a schedular tax based on the (actual or presumed) rental value was introduced by the *Wet van 29 oktober 1919 tot vestiging van cedulaire belastingen op de inkomsten en van eene bijkomende belasting op het globaal inkomen* (Law establishing schedular taxes on income and an additional tax on global income). In 1962, a personal tax on income from real estate (*Inkomen van onroerende goederen*) was introduced, based on the cadastral value of property (Traversa and Possoz, 2019). Since 2005, according to the *Loi portant réforme de l'impôt des personnes physiques* (Law reforming personal income

tax) of 2001, imputed rent is no longer subject to taxation. The mortgage interest deduction takes form of a tax credit without time limit. It is provided for new and owner occupied residential property ([van der Hoek and Radloff 2007](#), p. 399 and [Cheung 2011](#), p. 38). Tax on capital gains from the transfer of real estate is not levied, if occupied by the owner in the last 12 months.<sup>14</sup> The acquisition of new buildings is subject to VAT. VAT in Belgium was introduced by the *Loi du 3 juillet 1969 créant le Code de la taxe sur la valeur ajoutée* and took effect in 1971.

### *Brazil*

No information on the imputed rent tax for the owner-occupied dwellings could be found in Brazilian legal acts between 1922 and 2020. Therefore, it is assumed that such tax did not exist there. The possibility of mortgage interest deductibility was provided for in the *Lei nº 4.625, de 31 de dezembro de 1922* and was enacted in 1924. It was abolished by the *Decreto-lei nº 1.887, de 29 de outubro de 1981*. The capital gains tax existed during two periods: 1) 1946–1966, when it was introduced by the *Decreto-lei nº 9.330, de 10 de junho de 1946* and abolished by the *Lei nº 5.172, de 25 de outubro de 1966* and 2) since 1979, when it was re-introduced by the *Decreto-lei nº 1.641 de 7 de dezembro de 1978*. An analog of the VAT on newly built housing originated from the *Lei nº 5.172, de 25 de outubro de 1966*, which created the tax on services of any nature (*impôsto sobre serviços de qualquer natureza*) that covers also construction services and is levied by the municipalities.

### *Canada*

The first income tax in Canada was introduced in 1917 as a temporary measure to pay for war expenses (*Income War Tax Act, 1917*). In this act imputed rent was not considered as taxable income and this did not change in the following years. Since imputed rent was not taxed, home mortgage interest was not deductible either. The 1917 act only allowed mortgage interest deduction for rental property but not for owner occupied housing and this policy remained until the current day. Capital gains tax was introduced in 1971 (*1971 Tax Reform Legislation*) but included the principal residence exemption from the start, which means that capital gains

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<sup>14</sup><https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-belgiumhighlights-2019.pdf> and ([Cheung, 2011](#), p. 38).

derived from the sale of an owner occupied dwelling are not subject of taxation in Canada. The first VAT-like tax in Canada was introduced in 1920 (*An Act to Amend the Special War Revenue Act, 1915*) but only lasted for a very short time and did not apply to real estate. The manufacturer's sales tax of 1924 similarly applied to manufactured goods and not real estate. This changed in 1991 when the *Goods and Services Tax* was passed. Real property sales are taxed under this act ever since.

### Chile

The imputed rent tax for the owner-occupied dwellings existed between 1866 (*Decreto 30 de Abril de 1866, Contribucion sobre la renta*) and 1975 (*Decreto Ley n° 824, Ley sobre Impuesto a la Renta*). We suppose that the deductibility of mortgage interests was allowed during two periods: 1) until 1923, since it is not mentioned explicitly in the *Lei n° 3.996, que establece un impuesto sobre las rentas*<sup>15</sup> and 2) since 1975, when it was re-introduced by the *Decreto Ley n° 824* of 1974. The capital gains tax for owner-occupied housing was first introduced by the *Ley 20.780 de 2014 sobre Reforma Tributaria* beginning in 2016. Until then, only persons and firms whose business consisted in buying and selling real estates were subject to this tax. Although the value-added tax in Chile was introduced already in 1974 by the *Decreto Ley n° 825, Ley sobre impuesto a las ventas y servicios*, it did not cover construction services. It is only since 1987 that the *Ley 18630* incorporates them into the list of activities subject to the VAT.

### Colombia

Before 1961, property was subject to a real property tax upon the cadastral value. Assessment was carried out by the Geographic Institute and its cadastral offices (McLure and Zodrow, 1991, p.18). The imputed rent tax was introduced together with mortgage interest deduction and a capital gains tax for property transfer in the course of a major 1960 tax reform (*Law 81 of 1960 Reorganizing Income Tax*). Houses or apartments valued below 100,000 pesos remained tax-free, for other real property a progressive tax rate scale was introduced. A number of deductions were allowed including interest paid on loans. Capital gains tax on the transfer of real estate was introduced in the form that reduced the tax base by 10% for every year the property

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<sup>15</sup>By contrast, the *Decreto 30 de Abril de 1866* is very explicit on this matter.

was held. Thus, after 10 years an owner could sell the property tax-free. Under the current regulation, gains from selling real property are generally subject to a capital gains tax, whereby a lower rate applies for property held for at least two years (*National Tax Statute, Article 300*). The imputed rent tax was abolished by *Law 75 of 1986*. Mortgage interest payments were kept deductible up to a certain limit, which is regularly adjusted. VAT in Colombia was introduced in several phases starting from 1963. However, it was in fact never applied to owner-occupied housing, although an attempt was made by the *Law 1819 of 2016*, which however was declared unenforceable by the court and was repealed in 2018.

### *Czech Republic*

Prior to 1918, Czechia formed part of Austria–Hungary. Therefore, we assume that Austrian laws also applied to the Czech territory. The Czech Republic that gained independence in 1918 does not have a tradition of taxing imputed rent. In the period between the world wars, a house tax (per room) and a land tax have been applied in Czechoslovakia ([Englis, 1929](#), pp.227-228). Interest costs were not tax-deductible ([Spitaler, 1929](#), p.97f). This opportunity was only introduced by the *Law 210/1997* coming into force in 1998. The VAT has been introduced starting from 1993 by the *VAT Law 222/1992* and was also imposed on the transfer of immovable property (at a reduced rate for most cases) from the start. The 1992 *Act of the Czech National Council on Income Taxes* also introduced a tax on the income from the sale of immovable property, whereby such transactions become tax-free after a 2-year holding period.

### *Denmark*

The taxation of imputed rent goes back to the first introduction of income taxation in Copenhagen in 1861 and on the national level in 1903. In 2000, the taxation of imputed rent was replaced by a general property tax independent of income ([Wood, 2019](#)). With the introduction of national income taxation in 1903, mortgage interest payments also became deductible ([Torgersen, 1996](#)). But interest deduction even goes back to the 1881 Copenhagen Tax Act ([Zimmer, 1982](#)). The capital gains tax for owner-occupied housing was introduced in 1903 with exemptions for long holdings. In 1960 a special income tax scheme for ordinary people came into force with the result that the capital gains of most taxpayers were taxed ([Atkinson and Sogaard, 2013](#)). The VAT on new homes was imposed by the *Value added tax*

law of 1967, although VAT on new houses was partly deductible at a flat rate (Shoup, 1969). An exemption was introduced in 1994. This exemption for newly constructed buildings has however been abolished starting in 2011. Before the VAT there was the sales tax of 1962 (*Lov om almindelig omsætningsafgift*), however this act contained an exemption for real estate.

### Estonia

Prior to 1918, Estonia formed part of the former Russian Empire. Therefore, we assume that it was subject to the same laws as Russia. There is no tax on imputed rent in Estonia. The gains from the transfer of real estate are not taxed if the property has been the main residence of the taxpayer (*Income Tax Act of 1993*). Mortgage interest became deductible starting from 1996 through the *Income Tax Act Amendment Act of 1995*. Selling of new housing is subject to VAT since its introduction on the 1.1.1992 (*VAT Act of 1991*), although most other real estate transactions were made VAT-exempt by the *1995 Income Tax Act Amendment Act*.

### Finland

Income taxation was introduced in 1920 (*Laki tulo- ja omaisuusverosta 207/1920*) and included imputed rent taxation. The tax was revised in 1924 (*Laki tulo- ja omaisuusverosta 306/1924*) but remained similar to the former act which was copied from the Swedish model (Tapaninaho, 2016). In 1973 a separate law for imputed rent taxation was enacted (*Laki asuntulon verottamisesta eräissä tapauksissa 505/1973*). In 1992 this law was repealed and imputed rent taxation was replaced by a property tax. Interest deduction was introduced in 1920 but interest on capital invested in one's own home was exempted from this (*Laki tulo- ja omaisuusverosta 207/1920*). In 1943 mortgage interest payments became fully deductible (*Tulo- ja omaisuusverolaki 888/1943*) until 1973 when interest deduction was limited (*Tulo- ja varallisuusverolaki 1043/1974*). Capital gains were taxable under the 1920 act for a holding period of less than 10 years. Under the 1943 these gains were taxed with the same rules as capital gains from other assets (*Tulo- ja omaisuusverolaki 888/1943*). Since 1974 capital gains from selling one's home are tax free if the building was the permanent residence for at least one years before the transfer (*Tulo- ja varallisuusverolaki 1043/1974*). This was changed to two years in 1992. A sales tax was introduced in 1941 but with an exemption for real property (Linnakangas et al., 2016). A new sales tax came into force in 1964 but still with an exemption

for real property (Tait and Due, 1965). This exemption also remained for the VAT of 1993 (*Arvonlisäverolaki 30.12.1993/1501*).

### France

The imputed rent tax for the owner-occupied dwellings has a long history in France having its origins in as early as 1792 (Allix and Lecerclé, 1926). However, starting in 1965 it is not levied anymore, being eliminated by the *Loi n° 64-1279 de finances pour 1965* of December 23, 1964. The same *Loi n° 64-1279* allowed for the interest deductibility, until the *Loi n° 96-1181 du 30 décembre 1996 de finances pour 1997* suppressed it. Nevertheless, it was restored for a short period 2007–2010 by the *Loi n° 2007-1223 du 21 août 2007 en faveur du travail, de l'emploi et du pouvoir d'achat* in the form of a tax credit (*crédit d'impôt*). The capital gains tax was introduced in 1964 by the *Loi n° 63-254 portant réforme de l'enregistrement, du timbre et de la fiscalité immobilière* of March 15, 1963. Initially, after 10 years of possessing the real estate, the owner was exempted from the tax. However, over time, the period has been extended to 30 years. The VAT on newly built housing was first imposed in 1963 by the *Loi n° 63-254*.

### Germany

The first nationwide income tax in Germany was introduced in 1920. Before that, different German states had their own income taxes. In the law from 1920 (*Einkommensteuergesetz, 1920*), imputed rent was regarded as taxable income and therefore mortgage interest was regarded as an expense which leads to an income which meant that it was deductible. This changed in 1986 when imputed was not regarded as income under the *Einkommensteuergesetz* anymore. Since then imputed rent is not taxed and mortgage interest is not deductible. Starting from 1920 capital gains through the sale of a dwelling were taxable when they occurred within ten years after the purchase or when they were purchased for the purpose of reselling. The time limit was later reduced to only two years until 1999, when the German government introduced a change in legislation (*Steuerentlastungsgesetz 1999/2000/2002*). They reset the time limit to 10 years and made an exemption for owner occupied housing.<sup>16</sup> The first German sales tax was

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<sup>16</sup>At the moment of writing this paper, the leftist parties come with projects of sharpening taxation of capital gains. For example, the head of Berlin's Social Democrats N. Walter-Borjans suggested in January 2020 the introduction of a tax on land value increases *Bodenwertzuwachssteuer*.

introduced in 1918. Prior to that, there were different stamp taxes also for housing purchases. The sales tax included real property until 1932. From this point in time on, real property was excluded from the sales tax as long as real property transfer tax (*Grunderwerbssteuer*) was paid.

### *India*

Taxation of imputed rent was part of the Indian Income Tax from the beginning in 1860. *The Income Tax Act 1860* was meant to be a temporary measure to create more revenue but taxation of imputed rent remained in place throughout the 20th century until now. Since imputed rent was regarded as taxable income from land and houses, any interest that was paid on mortgage was deductible which is also the case under the *Income Tax Act 1961*, which is in application now. A capital gains tax was introduced in 1946 through an amendment of the Income Tax Act. The capital gains tax is also part of the current Income Tax Act, which covers gains from the sale of real estate and there is no exemption for a primary residence in place. A nationwide value-added tax was only introduced in 2017 (*Goods and Services Tax*). It is applicable to real estate, which is still under construction but does not apply to the sale of completed properties or resale of older properties. Before that there were several sales taxes on state level since the *Government of India Act 1935* allowed states to impose their own sales taxes, which usually did not involve residential properties.

### *Ireland*

Ireland gained independence from the United Kingdom in 1919, but the income taxation stayed the same for the following years. In 1970 (seven years after the UK), Ireland abolished imputed rent taxation (Merz, 1977). Mortgage interest deduction, on the other hand, remained in place for many more years but was downgraded gradually. In 1974, the government introduced a ceiling to mortgage interest relief which was cut in 1987, 1990 and 1997 (Norris, 2016). Mortgages taken out after 2012 are not entitled for mortgage interest relief. In 2015, the first-time-buyers relief was introduced, which is an amount of tax deducted at source from interest that is paid on money saved in certain financial institutions. A capital gains tax was introduced in 1975 (*Capital Gains Act, 1975*) but it included a private residence exemption. In order to join the European Economic Community Ireland had to introduce a VAT as well,

which it did in 1972 (*Value-Added Tax Act, 1972*). This tax also applies to newly built houses and is still in place today.

### *Israel*

Israel largely inherited the British law system in the initial years of its independence. The *1947 Income Tax Ordinance* included the imputed rent tax, mortgage interest deductibility and a capital gains tax for real estate. The 1968 reform abolished the first two but kept the capital gains tax (*Law on the Amendment of the Income Tax Ordinance No. 13*). The VAT was introduced in Israel in 1976 (*Value-Added Tax Law 5736-1975*). Sale of properties by VAT dealers is subject to VAT, transactions between private individuals are VAT-exempt.

### *Italy*

The imputed rent tax for owner-occupied dwellings in Italy is known since at least the *Regio decreto-legge n. 652* of April 13, 1939. It was abolished informally in 2000 ([Hilber, 2007](#)). The interest deductibility was established by the *Regio decreto 30 dicembre 1923, n. 3062*. The capital gains tax became effective since 1974, being introduced by the *Decreto del Presidente della Repubblica del 29 settembre 1973, n. 597*, but eliminated again by the *Finanziaria 2002* — *Legge 28 dicembre 2001, n. 448*. The VAT on newly built housing was introduced by the *Decreto del Presidente della Repubblica del 26 ottobre 1972 n. 633*. For a discussion of the 1974–2014 period see also [Bises and Scialà \(2014\)](#).

### *Japan*

In the case of construction of owner occupied houses by the household sector, a tax system different from that applicable to rental housing construction is applied. In particular, no tax is levied on the imputed rent and no interest cost is deducted from the taxable income ([Iwata et al., 1987](#), p. 23). Tax on capital gains from the transfer of real estate was for the first time introduced through the Income Tax Act of 1947 and had progressive rates between 25 and 65% ([Shiomi, 1957](#), pp. 66-69). VAT (or consumption tax) is levied on new homes starting with the introduction of VAT in Japan on April 1, 1989.<sup>17</sup> The consumption tax is imposed on the sale and purchase of housing and the construction of new housing at the time of hand over.

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<sup>17</sup>Japan: Selected issues. IMF country reports 18/334 <https://www.concieria.tokyo/eng/news/japanese-real-estate-expertise/190719eng>.

### *Latvia*

Prior to 1918, Latvia formed part of the former Russian Empire. Therefore, we assume that it was subject to the same laws as Russia. In the interwar period, a capital gains tax on real estate transfer was applied in Latvia (Siew, 1925, p.115). No tax on imputed rent and no interest tax deduction were applied. According to the current legislation (*1993 Law on Personal Income Tax*), no mortgage interest deduction is allowed. Transfer of real estate is tax-free if it is owned for longer than 5 years. The sale of new residential property is subject to VAT since 1995 *Law on value-added tax*.

### *Lithuania*

Prior to 1918, Lithuania formed part of the former Russian Empire. Therefore, we assume that it was subject to the same laws as Russia. Lithuania has not apply an imputed rent tax. The *2002 Law on personal income tax* introduced the possibility to deduct mortgage interest payments from the income. However, this clause has been removed by the *2008 Amendment of the law on personal income tax*. The same amendment set the holding period for the tax-free transfer of real estate to two years, instead of three years previously. Transactions with real estate are subject to VAT since its introduction by the *VAT law of 1994*.

### *Luxembourg*

The application of the imputed rent income taxation in Luxembourg has its roots in the German tax laws imposed in 1940 and kept by the *Grand-Ducal decree of October 26, 1944 concerning taxes, fees, contributions and duties*. The rental value of the home occupied by the owner has been treated as a source of income in the income tax law until the *Grand-Ducal Regulation of 23 December 2016 amending the amended Grand-Ducal Regulation of 12 July 1968 concerning the fixing of the rental value of the dwelling...*, which set this value to zero. Mortgage interest payments became deductible with the *Law of 29 December 1983 amending article 111 of the law of 4 December 1967 on income tax*. There is no capital gains tax on primary residence in Luxembourg. The VAT has been introduced in 1970 and applies to new real estate, although at a reduced rate (*VAT tax law*).

## Netherlands

There is no tax on capital gains from the transfer of real estate (Cheung, 2011, p. 39).<sup>18</sup> The tax on imputed rent was introduced through the *Wet op de vermogensbelasting* (Property Tax Act) of 1892, according to which the income from property over fl. 13.000 was taxed in the form of a fictitious yield of 4% (Fritschy, 1997, p. 1045). It currently still exists (Needham et al., 2018, p. 135). The mortgage interest deduction was introduced by the *Wet op de bedrijfsbelasting* (Business Tax Act) in 1893 as an element of the first personal income tax (van der Hoek and Radloff, 2007, p. 407) and it is still being applied (Needham et al., 2018, p. 136). The VAT in The Netherlands was introduced in 1968 by the *Wet op de omzetbelasting* (Turnover Tax Act). A “new” home is defined as the one that was bought before or no later than two years after the time at which it was first occupied. When buying new property in this sense, a 21% VAT is currently payable.

## New Zealand

The first income tax in New Zealand came into force in 1891 (*Land and Income Assessment Act, 1891*) and did not include taxation of imputed rent nor mortgage interest deduction. The following governments kept this policy in place including the *Income Tax Act 2007* which is the current legislation. Capital gains from the sale of property on the other hand were taxed under the *Property Speculation Tax Act, 1973* and currently under the *Taxation (Bright-Line Test for Residential Land) Act, 2015*. Neither of these two acts applies to the primary residence. Since the *Goods and Services Tax Act, 1985* the sale of new homes is subject to a value-added tax. This was not the case under different sales taxes before 1985 because they were only applicable to movable property.

## Norway

The imputed rent tax for the owner-occupied dwellings was already introduced in 1882 in Norway and confirmed in the big income-tax reform of 1911 (Torgersen, 1996). It was abolished in 2004 (Sørvoll, 2011). Interest deduction emerged very early in 1882 and remained in place

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<sup>18</sup>See also Stephen Brunner (Deloitte) International Tax Netherlands Highlights 2019, <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-netherlandshighlights-2019.pdf>.

ever since (Zimmer, 1982). The capital gains tax for owner-occupied housing was introduced in the income-taxation law in 1911 for speculative gains. In 1918 a 5-year holding exemption was introduced. This was changed to a 10-year holding rule later but since 1987 the capital gain is tax free if the house was owned for at least one year and was owner-occupied for at least one year during the last two years (Zimmer, 1982). A national sales tax for goods and property was introduced as a temporary measure in 1935 (*midlertidig omsetningsavgift til kriseformål*) and changed to a last link system in 1940. The taxes are not known to have exemptions for new housing constructions. The *Act relating to value added tax* was adopted in 1969 and real estate has been exempted since then.

### *Peru*

The imputed rent tax for the owner-occupied dwellings was introduced as soon as 1935 by the *Ley 7904 del 26 de julio de 1934* and was lifted in 1999 by the *Decreto Supremo N° 054-99-EF*. The deductibility of mortgage interests exists at latest since 1981 and was allowed for by the *Decreto Legislativo 200 — Ley del Impuesto a la Renta*. The capital gains tax was imposed already in 1935 by the *Ley 7904* of 1934. Between 1981 and 1998, it was not levied, according to the *Decreto Legislativo 200* of 1981. Since 1999, it is imposed again by the *Decreto Supremo N° 054-99-EF*. The VAT on newly built dwellings was introduced since 1973 by the *Decreto-Ley 19620* of 1972.

### *Poland*

According to the *1991 Income Tax Law*, imputed rentals for owner-occupied housing are not taxed and neither are realised capital gains if the property is held for more than 5 years. Interest deductibility was first introduced by the *Act of November 21, 2001 amending the act on income tax from natural persons*, but it was repealed already 5 years later by the *Act of November 16, 2006 amending the Personal Income Tax Act and certain other acts*. VAT was originally applied at a 0% rate to the sales of residential premises through real estate agents. This exemption has however been repealed by the *2001 Ordinance of the Minister of Finance amending the ordinance on the implementation of certain provisions of the Act on tax on goods and services and on excise duty*.

## Portugal

The imputed rent tax for the owner-occupied dwellings apparently has not been levied in Portugal, as no evidence of its existence could be found in the principal legal acts on personal income tax, between *Lei n.º 1368* of September 21, 1922 and *Decreto-Lei 442-A/88 Aprova o Código do Imposto sobre o Rendimento das Pessoas Singulares (IRS)* of November 30, 1988. The mortgage interest deductibility became possible starting from at least 1922 (*Lei n.º 1368*), but was suppressed in 2011 in accordance to the *Memorandum of Understanding on specific economic policy conditionality* imposed in the wake of the Great Recession by the Troika (the European Commission, the ECB, and the IMF). The capital gains tax was introduced by the *Decreto-Lei n.º 46373, Aprova o Código do Imposto de Mais-Valias* of June 9, 1965. The VAT on newly built housing is levied since the promulgation of the *Decreto-Lei 394-B/84, Aprova o Código do Imposto sobre o Valor Acrescentado* of December 26, 1984.

## Russia

The imputed rent tax for owner-occupied dwellings existed in Russia between 1892, when it was introduced by the Положение «О государственном квартирном налоге» of May 26 (14, according to the Julian calendar) 1892, and 1930, when it was abolished by the Постановление ЦИК и СНК СССР «О налоговой реформе» of September 2, 1930. Deduction of mortgage payments from income taxes was first provided for by the Положение «О государственном подоходном налоге» of April 19 (6), 1916. However, already in the next year, it was eliminated by the Bolshevik government. Its new life began 74 years later with the Федеральный закон № 112-ФЗ «О внесении изменений в статьи 220 и 224 части второй Налогового кодекса Российской Федерации» of August 20, 2008. Both prior to the October 1917 revolution and during the Soviet period, the capital gains tax was not levied. It is only the Закон РСФСР № 1998-1 «О подоходном налоге» of December 7, 1991 that made the sale of real estates subject to this tax. The VAT on newly built housing was first introduced by the Закон РСФСР № 1992-1 «О налоге на добавленную стоимость» of December 6, 1991. Prior to that, the predecessor of the VAT, the sales tax, did not cover transactions related to housing.

### *South Africa*

There is and was no tax on imputed rent in South Africa. Furthermore, there is no possibility of home mortgage interest deduction. The capital gains tax was introduced in 2001 ([South African Reserve Bank, 2015](#)) and included a primary residence beyond 1 million rand. This threshold rose to 1.5 million rand in 2006 and to 2 million rand in 2012. *The value-added tax Act 89 of 1991* was introduced in 1991 and includes an exemption for leasing but not for sales of residential property.

### *South Korea*

Between 1910 and 1945, Korea was under Japanese rule. Hence, it is assumed that in Korea the some homeownership taxation was applied as in Japan. The 1949 *Income Tax Act No. 33* did not include provisions for an imputed rent tax, interest cost deductibility, or a capital gains tax for owner-occupied housing. The capital gains tax adopted in 1967 aimed at reducing land speculation and made an exemption for housing owned for more than 3 years ([Cho and Kim, 1994](#), p.260). A later *Income Tax Act No. 6276* of 2000 introduced a possibility to deduct the interest paid on a long-term housing mortgage loan from labour income. The same law reduced the holding period needed for the exemption of a house transfer from the capital gains tax to two years. Currently, this period is set to 1 year (*Income Tax Act No. 15225*). A VAT was introduced in 1977 by the *Value-added tax Act No. 2934* and is since then applicable to sales of private housing.

### *Spain*

The imputed rent tax for the owner-occupied dwellings was introduced by the *Ley* of November 20, 1932 and removed by the *Ley 40/1998, del Impuesto sobre la Renta de las Personas Físicas y otras Normas Tributarias* of December 9, 1998. The same *Ley* of November 20, 1932 made mortgage payments deductible. Since January 1, 2013, this possibility does not exist anymore, because it was suppressed by the *Ley 16/2012, por la que se adoptan diversas medidas tributarias dirigidas a la consolidación de las finanzas públicas y al impulso de la actividad económica* of December 27, 2012. The capital gains tax was imposed by the *Real Decreto* of March 13, 1919 and at that time applied to the value increases of land (*incrementos de valor de los terrenos*). Since then, its existence has been confirmed by many consequent legal acts.

The VAT on newly built housing was enacted on January 1, 1986 by the *Ley 30/1985, del Impuesto sobre el Valor Añadido* of August 2, 1985, which introduced for the first time in Spain the value-added tax. No information on any similar tax (e.g., sales tax) used until 1985 could be found.

### *Sweden*

In 1910, an imputed income tax based on property assessment was added to the general income taxation at the local level, amount to about 6–7% (Stenkula, 2015). This taxation was in addition to the true income coming from real estate and municipalities estimated a hypothetical value to assess imputed rents. In 1920, a guarantee system was implemented at the local level, which assured municipalities a tax flow even if the property did not generate direct income. In 1953, this system was more formalized in a system referred to as *villaschablon* where owner-occupiers (of one- or two-family houses) could also deduct interest payments from the imputed tax assessment base. However, interest deduction goes back to the state income tax of 1902 (*Inkomstskatt*), when interest payments were deductible on the state level and 1920 for the municipal level (Zimmer, 1982). The tax rate on imputed income was 3%, but lowered to 2.5 and 2% in 1957 and 1965, respectively. In 1967, a progressivity was added, with rates between 2–8%, subject to various changes. Generally, the tax system was explicitly meant to aim at “neutrality of tenure” between the four different tenure forms: family-house ownership, flat ownership and public and private rentals (Bengtsson, 2006). This taxation principle was made explicit in 1974 and mainly motivated additional subsidies for owner-occupiers. In 1985, an additional tax on old apartment flats, including those of housing associations, was introduced to make the tax system more equitable. The tax reform in 1990–1991 abolished the system of imputed rents, while the reform of 2008 abolished real estate taxes in the traditional sense altogether and replaced them with an annual “fee”. The former neutrality principle can be said to have stopped functioning since the 1990s (Bengtsson, 2006). In 1911, the taxation of both wealth and capital gains was introduced (Stenkula, 2014). Speculative gains were distinguished from non-speculative ones by exempting gains made after certain holding periods. Residential wealth was taxed at 75% of market value according to the *taxeringsvärdet* (Du Rietz and Henrekson, 2015). Wealth taxation itself was abolished in 2007. In 1996, the capital-gains tax was estimated to add 0.38% to annual real estate taxes (Stenkula, 2015). When real estate

taxes were transformed to a fee in 2008, the tax rate on capital gains on housing were increased from 20 to 22% and the possibilities to postpone the tax reduced (Stenkula, 2015). Custom duties and individual consumption taxes were replaced by a general value-added tax in 1960 (Stenkula, 2015), but sales of real estate are exempted.

### *Switzerland*

The first income tax in Switzerland was introduced in 1915 as a temporary measure to pay for war expenses (*Bundesbeschluss betreffend die eidgenössische Kriegssteuer*), but did not include a taxation of imputed rent. This changed in 1934 with another temporary measure (*Eidgenössische Krisenabgabe*). Since then, taxation of imputed rent and mortgage interest deduction remained an integral part of the Swiss tax system. Whether capital gains from the sale of a house were subject to taxation was dependent on the location of the estate for a long time since the different Cantons introduced a capital gains tax for real estate at different times. While some municipalities in Solothurn already introduced such a tax in 1912, other cantons followed in the second half of the 20th century (e.g., canton Glarus in 1971). Since 1990, all Cantons are required to impose a capital gains tax on real estate sales (*Bundesgesetzes über die Harmonisierung der direkten Steuern der Kantone und Gemeinden*). Real estate sales were not subject to sales tax throughout the history of Switzerland.

### *Turkey*

Imputed rent taxation seems to have a long history in Turkey. The estimated rental income of a building has been taxed at least since 1910 (Halil, 1938, pp.39-41). The 1931 *Building tax law No. 1837* prescribed that the value of the building is estimated and 10% of it is accepted as net income subject to a tax. The 1934 *Income Tax Law No. 2395* and a number of its later editions until today included provisions specifying the assessment of the equivalent rental value and its taxation. These laws only allowed for interest cost deductions for rented housing, and not for owner-occupied housing. The 1970 *Financing Law No. 1318* introduced a real estate value increase tax, and overruled the previous provision of the 1949 *Income Tax Law No. 5421* that left proceeds from real estate transfer tax-free after a 2-year holding period. The universal coverage was however abolished by the 1981 *Law on Amendments to the Articles of the Financing Law No. 1318 on the Real Estate Gains Tax*. Currently, only earnings arising

from the disposal of the real estate within five years starting from the date of acquisition are subject to the capital gains tax (*Income Tax Law No. 5615 of 2007*). Real estate delivery in Turkey is in general subject to VAT since its introduction from 1985 onward (*VAT Law of 1984*). There exist multiple VAT rates for different provinces and areas.

### *United Kingdom*

Imputed rent taxation was first introduced in 1803 in the United Kingdom under Schedule A of the *Income Tax Act, granting His Majesty, until the sixth day of May next after the ratification of a definitive treaty of peace, a contribution on the profits arising from property, professions, trades and offices*) as a temporary measure passed on August 11, 1803. It was then reintroduced in 1842 along with the possibility to fully deduct mortgage interest. Although the taxation of imputed rent was abolished in 1963, mortgage interest deductibility remained for many more years but was slowly phased out at the end of the 20th century, providing a so-called “homeownership bias”. In 1974, the ceiling for mortgage which was eligible for deduction was set to 25 000 pounds. In 1983, the UK government introduced MIRAS (Mortgage Interest Relief at Source), which lasted until 2000, when mortgage interest deduction came to an end. The capital gains tax was introduced in 1965 but included an exemption for owner occupied housing from the start which is applicable until now. The same is true for the value-added tax, which does apply to real estate, therefore meaning that neither capital gains nor sales of one’s personal home were taxed in the United Kingdom.

### *USA*

In contrast to other countries, the homeownership policies did not change a lot over the years in the United States. In the *Revenue Act of 1913*, all interests were tax deductible, including mortgage interests. Although this changed in 1986 (*Tax Reform Act of 1986*), mortgage interest remained deductible throughout the years. This is quite an exception because most countries that allow mortgage interest deductibility view imputed rent as taxable income, which was never the case in the USA. Also starting in 1913, capital gains were taxed with the same rate as income. The rate of taxation changed multiple times until 1997, when the government introduced an exemption for owner occupied housing. Up to 250,000 dollars (500,000 dollars for married couples) of capital gains are not taxed when the property was owner occupied for

at least 2 of the last 5 years. Since there is no federal sales tax in the United States, the sales taxes vary substantially across states. But generally the sales tax does not apply to transfer of real property. There are only very few examples of sales taxes that include real property (e.g., Washington).